

C & O Puts Brake Repair on Production Lines . . . Page 25

RAILWAY

LOCOMOTIVES AND CARS

A SIMMONS-BOARDMAN TIME-SAVER PUBLICATION

MAY 1959

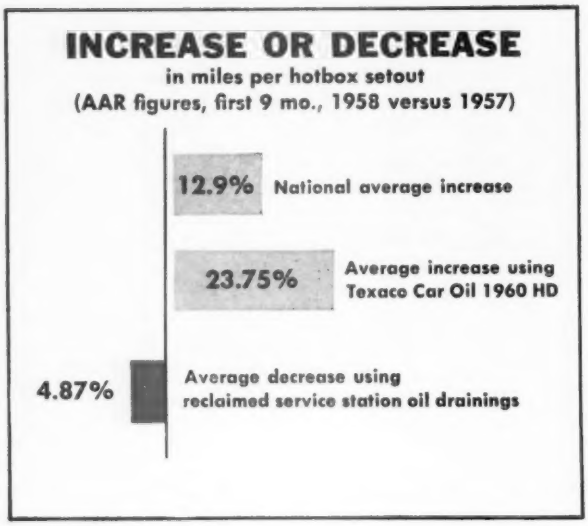
Extra-Long Piggyback Cars Proving Popular . . . Page 23

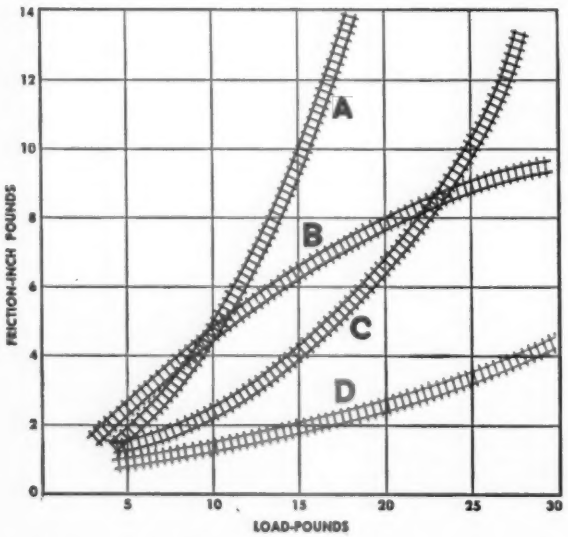


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AMERICA'S OLDEST TRADE PAPER

Reclaimed service station oil drainings are FALSE ECONOMY in journal-bearing lubrication

• AAR figures show Texaco premium car oil definitely increases mileage between hotbox setouts





There's less friction throughout the load range with Texaco Car Oil 1960 HD (curve D) than with AAR Car Oil (A) or either of two competitive premium car oils (B and C).

AAR figures for the first nine months of 1958 against the first nine months of 1957 show there's no economy in lubricating journal bearings with reclaimed service station oil drainings. Despite a national average *increase* of 12.9% miles per hotbox setout, seven prominent U. S. railroads using reclaimed service station oil drainings 100% for journal-bearing lubrication got a *decrease* of 4.87% miles per setout. Five prominent U. S. railroads using Texaco Car Oil 1960 HD 100% got an average *increase* of 23.75% miles per setout—almost twice the national average.

What it can cost—Each hotbox costs about $200, minimum—a lot more where perishable cargo is involved or if a pile-up is caused by derailment. When the apparent savings in the initial cost of reclaimed service station oil drainings are compared with what it costs in extra delays and costly repairs, the savings disappear and there's a big hole in profits.

Two kinds of proof—Actual in-service use proves the economy of lubricating journal bearings with Texaco Car Oil 1960 HD, and there's plenty of scientific evidence to show you why this new Texaco car oil can effectively reduce your hotbox rate.

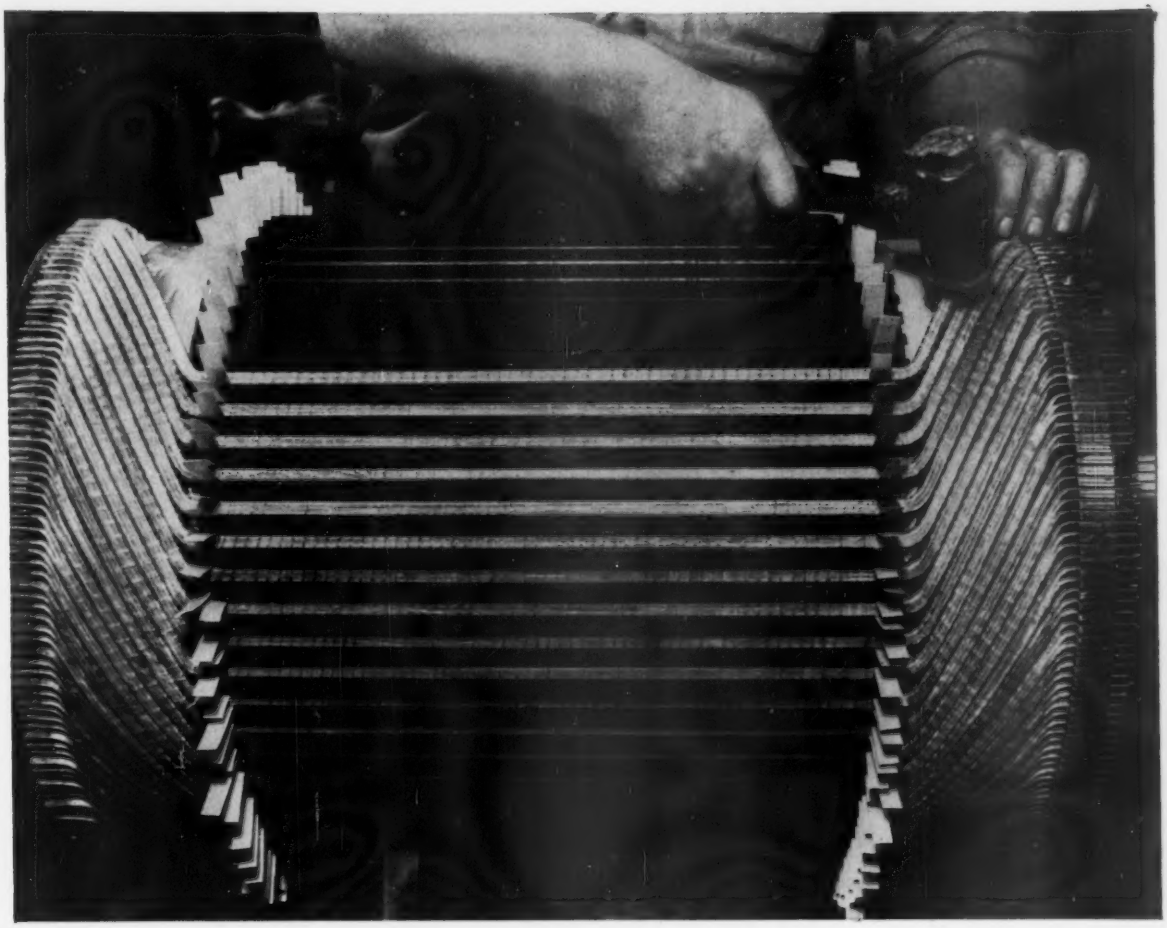
Get all the facts—Ask your Texaco Railway Lubrication Engineer for a complete report on Texaco Car Oil 1960 HD—and let him show you what it can do for your operation. Or, write:

☆ ☆ ☆

The Texas Company, *Railway Sales Division,* 135 East 42nd Street, New York 17, N. Y.



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Call in your nearby National Electric Coil field engineer for complete information, then order a trial quantity of Neccobond armature coils. Prove to your own satisfaction that these coils add life to your traction motors... cut rewind time... save money!

***Neccobond** armature coils are insulated with mica and glass, pre-impregnated with a catalytic-type, high temperature resin. Controlled curing then produces an insulating wall with markedly improved characteristics.

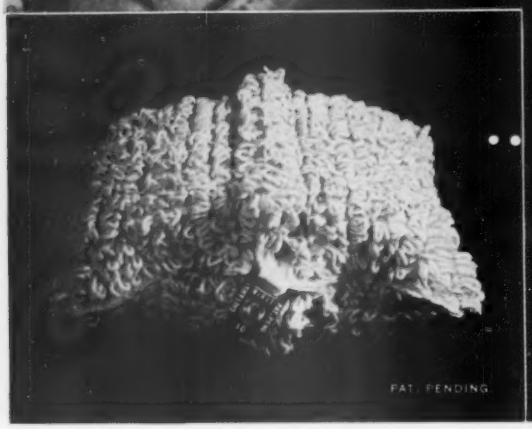
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journal lubricators



....with 4 exclusive features!

● **Specially Constructed Center Wick**—One-third of the pile fabric is in the center wick. If there is any oil in the box, WIKIT absorbs it!

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● **Specially Shaped** – WIKIT lubricates the entire journal . . . is shaped to oil end collar and fillet without exposing main body of lubricator to damage.

WIKIT absorbs and retains 5 pints of oil or more, depending upon size...after saturation and draining 3 hours. Provides continuous lubrication under toughest usage and all weather conditions. Nylon tape secures non-ferrous pull handles to lubricator ends . . . has tensile strength in excess of 500 pounds. Cores are quality neoprene foam . . . resistant to oil, heat, and compression set . . . no metallic parts except pull handles. WIKIT is made for all journal sizes . . . is realistically priced. See your nearest Sales Representative!



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RAILWAY
LOCOMOTIVES AND CARS

The Oldest Trade Paper
In the United States

May 1959—VOL. 133 NO. 5

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FOREIGN REPRESENTATIVES: Sibley-Field Publishing Company, Ltd. 8/9 Clerkenwell Green, London E. C. 1, England; Georg J. Linder, Continental European Representative, (16) Frankfurt a. Main, Wittelsbacher Allee 60, West Germany.

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Railway Locomotives and Cars is a member of the Audit Bureau of Circulation (A.B.C.) and is indexed by the Engineering Index Service. Printed in U.S.A.

Published monthly by the Simmons-Boardman Publishing Corporation at Periodical Press Corporation, 3rd & Hunting Park ave., Philadelphia 40. James G. Lyne, Chairman of the Board; Arthur J. McGinnis, President and Treasurer; Duane C. Salisbury, Exec. Vice Pres.; Fred A. Clark, Vice-Pres. and Sec.; George Dusenbury, Vice-Pres. and Editorial and Promotional Director; M. J. Figa, Vice Pres. and Director of Production.

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Circulation Department: **R. C. Van Ness, Director of Circulation, 30 Church st., New York 7.** Second-class postage paid at the Post Office at Philadelphia, Pa. Subscription price to railroad employees only in U.S. possessions and Canada, $2 one year, $3 two years, payable in advance. Subscription price to railroad employees elsewhere, $8 per year. Single copies, 75¢. Address all subscriptions and correspondence concerning them to: Subscription Department, Railway Locomotives and Cars, Emmett st., Bristol, Conn. Changes of address should reach us three weeks in advance of the next issue date. Send old address with the new, enclosing, if possible, your address label. The Post Office will not forward copies unless you provide extra postage. Duplicate copies cannot be sent.

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REPORT FOR MAY

To Remind You!

June 23-25 are the dates for the annual meetings of the AAR Mechanical Division and the Electrical Section of the Engineering and Mechanical Divisions at the Hotel Sherman, Chicago.

Schiffers Becomes Executive Secretary, ARSA

Albert Schiffers, Jr., has been appointed executive secretary of the Allied Railway Supply Association and secretary of the Committee of the Coordinated Associations. Mr. Schiffers, who succeeds J. D. Ristine, deceased, was formerly purchasing agent for the Union Tank Car Company. He retired in 1958 after 45 years service.

European Railroad Research Praised

Up-to-date techniques, improved equipment design, well-coordinated research programs, and a high level of technical competence have been attributed to the European railroads by P. V. Garin, manager of research and development, Research and Development Department of the Southern Pacific. Mr. Garin reported this to one session of the second joint ASME-AIEE Railroad Conference held in Chicago on April 8 and 9. Over 200 members and guests attended the meetings.

During September and October 1958, Mr. Garin visited headquarters and research laboratories of the French, Swiss, Italian, German, British, Belgian, and Netherlands railroads. Hydraulic transmissions appear to be gaining favor on European railroads, particularly those not already committed to electric drive. The Voith and Maybach transmissions used in Germany are said to be well proved in service under actual operating conditions. Mr. Garin believes applications of this type to American design locomotives should be given particular study, especially for heavy freight service on mountain grades where electrical maintenance and wheel slipping are severe. Modern transmissions are now available with outputs as high as 1,800 hp per transmission and can be installed in multiple on individual locomotive units.

Mr. Garin found no interest in the atomic locomotive where the nuclear reactor is installed in the unit. It was generally felt the application would be in a central power plant using nuclear fuel and transmitting electricity by overhead lines. With extensive electrification existing on, or contemplated for, European railroads, this application was regarded possible provided the cost would be economically attractive. There is limited interest in the gas turbine and free piston locomotives. No attempt was being made to burn residual fuels, since the price differential did not warrant consideration.

Other items discussed by Mr. Garin included the operation of an anti-slip brake used on the Swiss railroads, which eliminates use of sand for wheel-rail adhesion (RL&C, Jan. 1957, p 46); increasing use of overhead electrification in France, Holland, Belgium, and Sweden; extensive use of welded rail up to 2,625-ft lengths, and a growing interest in concrete ties. Mr. Garin feels that the American railroads have been overlooking a valuable source of new ideas and practices by not keeping in closer contact with European developments.

A break-through in suburban commuting service, reported by A. G. Dean, chief engineer of the Budd Company, has been

(Continued on page 8)

TIME SAVING IDEAS FOR MAY

MOTIVE POWER AND CAR

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ELECTRICAL

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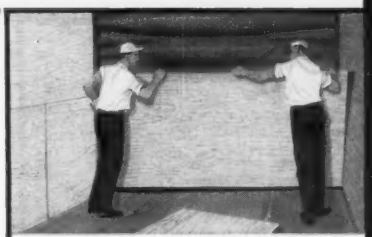
DEPARTMENTS

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What's New in Equipment 12
Personal Mention 56
Supply Trade Notes 57

MISSOURI PACIFIC LINES

cuts costs

Only Exterior Fir Plywood car lining has all these advantages:



LOW COST—Easy to install fir plywood lining speeds work . . . saves 50 per cent and more in labor costs alone.

with Fir Plywood boxcar lining

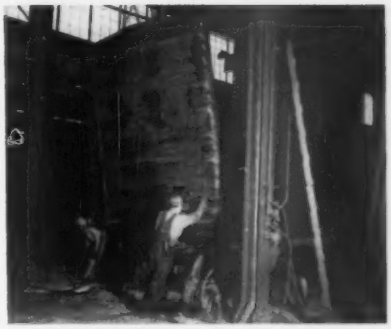
Missouri-Pacific reports Exterior plywood speeds work, saves 10 man hours per car

EXTERIOR FIR PLYWOOD car lining plays an important role in the big, fast-moving operation at Missouri-Pacific's construction yard at DeSoto, Missouri, where modern assembly line techniques can send a new boxcar into service every hour of the day.

The in-place cost of the plywood car lining is less than T & G lumber, chiefly because it can be installed so much faster. Shop officials estimate that fir plywood saves over 10 man hours per 40-foot car. Total lining costs (including labor and materials) comes to less than $220 per car.

For Mo-Pac fir plywood has demonstrated its superiority in other ways, too. Interior surfaces are smooth, and the danger of infestation is minimized. Shippers like it because it's a clean (and easy-to-clean) lining that protects valuable ladings. Waterproof Exterior plywood is a strong, tough, rugged material capable of shrugging off blows that would split ordinary lumber.

Over the long haul, too, fir plywood lining pulls its freight with lower maintenance and longer life.



At their DeSoto shops, Mo-Pac does big things in a big way, *fast*. Specially developed high-speed assembly line technique sends 8 new boxcars into service every day.



Exterior plywood is nailed horizontally with ¾" fir plywood for side walls and 1" fir plywood for end walls. Crews use cement-coated nails with a special spiral thread for better holding power.

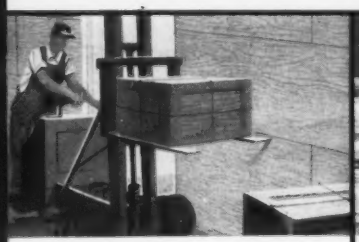
FOR MORE INFORMATION about fir plywood—its uses, properties and advantages—write

DOUGLAS FIR PLYWOOD ASSOCIATION
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Always specify by DFPA grade-trademarks

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STRONG — Plywood has tremendous impact resistance . . . shrugs off blows that would split ordinary lumber.



SMOOTH — Clean, snag-free fir plywood lining pays off by yielding higher tariffs on fragile ladings.



WATERPROOF — Exterior plywood is made with waterproof marine glue, in several sizes and grades, including overlaid panels with hard, smooth, fused-resin fiber overlays.

Report

(*Continued from page 5*)

the application of electric propulsion to the Pioneer III (RL&C, Aug. 1958, p 21). This car was first presented as a minimum-weight passenger coach in 1956. Six Pioneer III multiple-unit cars on the PRR have been in service nine months at an 80,000-miles-per-year rate. Good performance, with considerably reduced power requirements and moderate traction equipment cost, has been ascribed to this equipment. These new cars weigh 38 per cent less and are 35 per cent longer than older PRR units, yet acceleration is 30 per cent greater with one-third the horsepower. Mr. Dean concluded that early operational experience indicates these cars will be a considerable contribution to the commuting service problem.

Ex Parte 174

TO THE EDITOR:

Are you planning to correct the March article on Ex Parte 174, page 25, where you show a "yes" for what is really not an open end platform? I would think a correction is in order. Actually, the locomotive shown is a peculiar one since it has a continuous hand rail plus a chain and ramp. Where did you ever get such a picture?

Disgusted

We stand corrected. See below.—Editor



Road switcher with open end platforms "not protected their full width by a continuous barrier" as specified by recent ICC order.

AAR Conditionally Approved Lubricators

Conditional approval has been granted by the AAR Lubrication Committee to the Acme and Spring Pak journal lubricators. The AAR conditionally approved lubricator list now includes Acme, Journapak,

(*Continued on page 56*)

Orders and Inquiries for New Equipment

Placed Since the Closing of the April Issue

Diesel-Electric Locomotive Orders

Road and; builder	*No. of units*	*Horsepower and type*	*Detail*
SANTA FE:			
Alco	9	2,400 DL600B	——
Electro-Motive	15	2,400 SD24	——
TEXAS & PACIFIC:			
Electro-Motive	8	1,750 GP-9	Delivery this month.

Freight-Car Orders

Road and builder	*No. of cars*	*Type of car*	*Detail*
BALTIMORE & OHIO:			
Company shops	500	Hopper	50-ton; 33-ft. To be completed this month.
	500	Gondolas	70-ton; 52-ft 6-in. Construction begun.
CANADIAN NATIONAL:			
National Steel Car	400	Piggyback flat	46-ft. Delivery by August.
CHESAPEAKE & OHIO:			
American Car & Foundry	50	Piggyback flat	85-ft. with tie-down equipment. Delivery to start in August.
	250	Box	To have special loading devices. Delivery to begin August 15. Cost, $2,500,000.
Pullman-Standard	250	Box	50-ft 6-in. with double doors and special loading devices. Delivery to start in June.
Company shops	100	Covered hopper	"Jumbo."
CHICAGO GREAT WESTERN:			
Pullman-Standard	10	Covered hopper	70-ton, 3,219 cu ft cap. Cost, $121,500.
ERIE:			
Pullman-Standard	200	Box	50-ton, 50-ft 6-ft., with special loading devices. Deliveries begun. Est. cost, $2,600,000.
GREAT NORTHERN:			
American Car & Fdry.	500	Box	To be equipped with roller bearings, nailable steel flooring, 42-in. high inside steel lining, and 12-ft door openings, with both sliding and plug doors. Delivery beginning in June.
GREEN BAY & WESTERN:			
Pullman-Standard	50	Box	50-ton, 40-ft, with roller bearings. Specially equipped. To be acquired through lease arrangement with Equitable Life Assurance Society. Delivery about June 1.
ILLINOIS CENTRAL:			
Pullman-Standard	50	Covered hopper	70-ton. Delivered in March.
MINNEAPOLIS & ST. LOUIS:			
Company shops	15	Flat	All-steel bulkhead, with General Steel Castings one-piece cast-steel underframes.
NORFOLK & WESTERN:			
Company shops	1,000	Hopper	70-ton, Cost $9,000,000.
NORTHERN PACIFIC:			
Pacific Car & Foundry	50	Mech. refrigerator	50-ton. Est. unit cost, $26,400. Second quarter delivery.
SOO LINE:			
Pullman-Standard	25	Box	40-ft. 6-in PS-1 with belt-loading devices. June delivery.
WABASH:			
Pullman-Standard	25	Box	50-ton, 40-ft 6-in., with 8-ft doors. For New Jersey, Indiana & Illinois. Delivery this month.
Company shops	150	Flat	60-ft, 50-ton. Second and third quarter delivery.
	200	Box	50-ft 6-in., with 8-ft single doors.
	350	Box	50-ft 6-in., with 15-ft double doors. 340 of 550 company built box cars to be delivered this year.
WESTERN MARYLAND:			
Bethlehem Steel	30	Flat	50-ton. June delivery.
Pullman-Standard	10	Trailer flat	70-ton. June delivery.
WESTERN PACIFIC:			
Pullman-Standard	25	Gondolas	70-ton
	25	Gondolas	70-ton, for Sacramento Northern.
	10	Covered hoppers	70-ton, for Sacramento Northern. Total order of 60 cars for mid 1959 delivery.

Notes and Inquiries

Canadian Pacific has completed purchase of four 10-roomette, 5-bedroom sleepers and four 5-bedroom, buffet-lounge observation cars from the New York Central.

Elgin, Joliet & Eastern applied rubber draft gears, 70-ton capacity trucks and Brandon load-restraining devices to 25 flat cars for use in transporting tin plate in coils.

Minneapolis & St. Louis will convert 35 flat cars for piggyback service. Cars to be equipped with ACF retractable hitches.

Monon will convert four gondola cars to container cars, each to handle 11 demountable containers. Another 10 gondolas may be converted to piggyback flat cars during 1959.

Norfolk & Western plans to acquire at least 2,500 freight cars in each of the years 1960 and 1961. 1,000 hopper cars listed above are in addition to a 1,500-car program now under way.

Rock Island is leasing, through North American Car Corp., the 100 85-ft piggyback flat cars ordered by North American from Pullman-Standard as reported in the April issue.

"National" Brush Men handle emergencies . . .



NATIONAL TRADE MARK has the organization to help solve any brush problem!

- *A nation-wide sales and service organization consisting of 27 strategically located representatives.*
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Your "National" Brush Man is an experienced technician whose career is based on a thorough knowledge of brushes and railroad electrical equipment. His analyses and recommendations contribute to your immediate and long range cost reduction programs. Call him next time you have a brush problem. Or write: National Carbon Company, 30 East 42nd St., New York 17, N. Y.

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OFFICES: Atlanta, Chicago, Dallas, Houston, Kansas City, Los Angeles, New York, Pittsburgh, San Francisco • **CANADA:** Union Carbide Canada Limited, Toronto



Here's the dust guard that keeps oil in, keeps dirt and water out! It fits snugly into the dust guard well, and around the dust guard seat of the axle for effective closure with minimum friction. With lubricating devices which permit free oil to collect in the bottom of the box, proper closure now becomes more important than ever before.

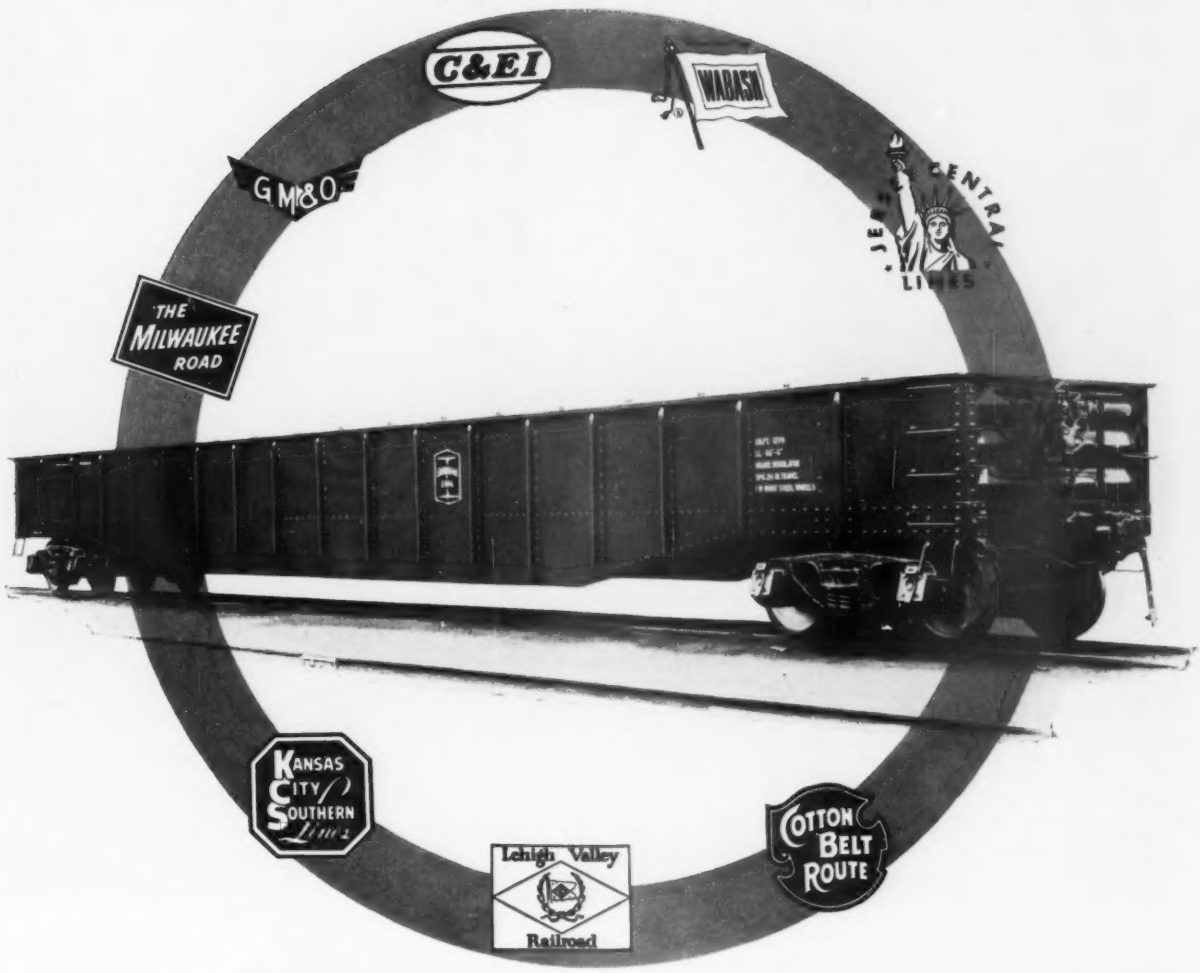
Secret of the Absco dust guard's success is the resilient synthetic foam molded over a tough, pressed, resin-impregnated fabric core. It fits the dust guard well firmly enough to prevent shifting during normal lateral movement of the axle, yet is free to move under severe misalignment or impact. Minimum friction is exerted against the axle because foam is molded to present a concave surface to the dust guard seat.

Initial road testing shows that the American Brake Shoe Company's new Absco dust guard is unaffected by water or oil. It retains its resilience at both high and low temperatures. It is simple, sturdy, long-lasting . . . and econo cal. Your Brake Shoe representative will be glad to give you further details.

RAILROAD PRODUCTS DIVISION
530 FIFTH AVENUE • NEW YORK 36, N.Y.

AMERICAN Brake Shoe COMPANY

A-2999



A Proven Way to Reduce Car-Building Costs

Standard designs and production methods of building result in big savings to the purchaser of freight cars. This is particularly true when two or more railroads place orders at the same time for the same type of car.

Bethlehem is well set up to use mass-production methods in car building. When a standard Bethlehem-engineered design is specified by several railroads, the full benefits of mass production accrue to each buyer. Much special tooling —including special jigs and dies—can be eliminated. So, too, can expensive time losses caused by changeovers. Costs per car come down, and large total savings are possible on each order.

Standardization has cut costs for the eight railroads whose emblems appear above. All use the standard Bethlehem-built gondola shown in the photograph. This is a 65-ft 6-in. car of exceptionally rugged design. Meeting the full list of AAR requirements, it has proved its economy in service as well as in first cost.

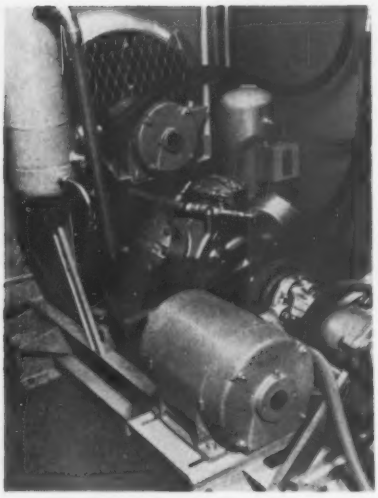
You can save money by ordering Bethlehem's standardized designs for this and other cars. Plans can be modified in certain details to meet your particular needs. Call us at any time for complete information.

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Direct-Drive Refrigeration Units

A new line of Carrier direct-drive reefer refrigeration units includes systems with two, three and four-cylinder compressors, depending on the size of the car and the desired temperature range. The alternator-motor transmission formerly used is eliminated.

Humidity is maintained at controlled levels for fruit and vegetables, assuring top quality at destination. Like their predecessors, the units can run on standby electric power when desired. To maintain temperatures at above freezing levels in cold weather, the Carrier hot refrigerant gas-heating system is used. Controls can change from the cooling to heating cycle and back automatically as required.

Fuel economy is secured in two ways—by powering the compressor directly from the diesel and by having the controls drop the engine speed when the system is not under full refrigerating load. The smaller diesel and elimination of the alternator and exciter cut maintenance expense.

Further fuel economy and better humidity control are secured by another device. Once the temperature of the car interior has been drawn down to the thermostat setting, the control system "unloads" one or more of the compressor's cylinders. With less compression of refrigerant, the temperature of the evaporator coil is held within a few degrees of that of the air inside the car. Thus, less moisture is condensed out, air circulation continues, and humidity is held at high levels to preserve cargo qualty.

Seven units are in qualifying operation by four major car builders now, and some have been in successful service for as long as a year. *Carrier Corp., Dept. RLC, Syracuse 1, N.Y.*



Journal-Box Dust Guard

The Absco dust guard is designed to reduce oil loss and keep dirt and water from entering the back of the box. It consists of resilient synthetic foam molded over a pressed, resin-impregnated fabric core and fits the dust-guard well firmly enough to prevent shifting during normal lateral movement of the axle, yet is free to move under severe misalignment or impact. Minimum friction is exerted against the axle because the foam is molded to present a concave surface to the dust guard seat.

Somewhat stronger than plywood, the resin-impregnated core is correspondingly smaller than an ordinary guard, allowing extra thick foam for improved durability and closure. Resistance to warping, chipping, and impact is also increased. *Dept. A, American Brake Shoe Co., Dept. RLC, 530 Fifth ave., New York 36.*

Nickel-Cadmium Batteries For Refrigerator Cars

Sintered-plate, nickel-cadmium batteries for starting diesel engines in mechanical refrigerator cars promise to give over 10 years more service than lead-acid batteries, recent in-transit tests by the Pacific Fruit Express Company disclose. Most of the new batteries, which are replacing conventional lead-acid batteries previously used, have also demonstrated better performance at low temperatures.

The 12-volt Sonotone battery used in Pacific Fruit refrigerator cars has a 60 amp-hr capacity and weighs 62 lb. It is 8½ in. high, 5 in. wide, and 18 in. long. It consists of 10 cells stacked in a row. Each cell is made up of plates of carbonyl nickel powder, developed for this purpose by the International Nickel Company, sintered on a foundation of nickel wire mesh. Nickel oxide is the active material in the positive plate; metallic cadmium in the negative. The electrolyte is a 30-per cent by weight solution of potassium hydroxide in distilled water. *Battery Division, Sonotone Corp., Dept. RLC, Elmsford, N.Y.*



Dielectric Test Set

A dielectric test set, available in portable and bench models, is designed for making step-voltage resistance tests and breakdown and 1-min resistance tests on insulation in electrical equipment with ratings in the 300-, 600- and 2,500-volt a-c or d-c classes. Maximum output current is 5 milliamps at output voltages up to 2,500 volts. The portable set is housed in a shock-and-wear resistant plastic case with a compartment for the leads. The test set has a full-wave, dry-type rectifier and separate meters for measuring output voltage and current. It weighs 26 lb. It is claimed that the output voltage characteristic has low ripple even when low insulation resistance is being measured, and that the equipment is protected against damage by short-circuit even at maximum output voltage. *James G. Biddle Co., Dept. RLC, 1316 Arch st., Philadelphia 7.*

Carbon Remover And Solvent

F.O.-286 is a non-flammable solvent degreasing liquid which removes carbon, oxidized oil, tar, paint, stains, rubber and

(*Continued on page 18*)



Its performance and name are the same around the world

Other outstanding Shell Industrial Lubricants

Shell Tellus Oils—for hydraulic systems
Shell Alvania Grease—multi-purpose industrial grease
Shell Rimula Oils—for heavy-duty diesel engines
Shell Turbo Oils—for utility, industrial and marine turbines
Shell Dromus Oils—soluble cutting oils for high-production metalworking
Shell Macoma Oils—for extreme pressure industrial gear lubrication
Shell Voluta Oils—for high-speed quenching with maximum stability

Shell Talona R Oil 40 is available world-wide, assuring railroad operators abroad the same outstanding diesel lubrication that domestic carriers rely upon.

Talona® R Oil 40 offers two outstanding reasons for its acceptance as a top-rated diesel-locomotive lubricant: (1) It provides superior antiwear protection. (2) It maintains peak engine performance.

Greatly reduced wear of piston rings and cylinder liners is assured because of the selected combination of additives used in Talona R Oil 40. It has high oxidation stability, combined with resistance to corrosion and sludge formation. It prevents ring fouling and provides excellent detergent-dispersant action.

For complete information, write Shell Oil Company, 50 West 50th St., New York 20, N. Y., or 100 Bush St., San Francisco 6, Calif. In Canada: Shell Oil Company of Canada, Ltd., 505 University Ave., Toronto 2, Ont.

SHELL TALONA R OIL 40

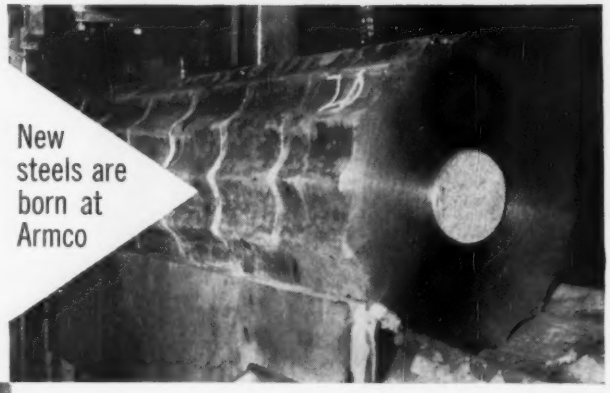
the crankcase oil for diesel locomotives

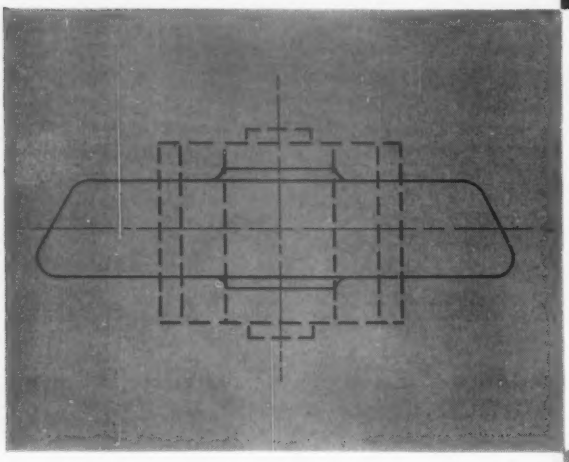
SHELL

Why you get more service miles per dollar with Armco One-Wear Wrought Steel Wheels

They're made from sound ingots

"Hot tops" on every ingot mold serve to keep gas holes and porosity (pipe) out of the steel ingot proper. And because Armco Wheels are made from ingot slices, cross-sectional surfaces of every slice *can be and are* closely inspected for quality.



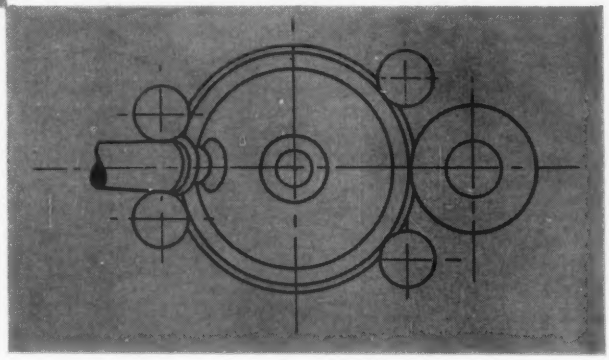


They're forged

Coarse cast structure is completely eliminated in two heavy forging operations. Thousands of tons of pressure squeeze the ingot slice into the basic shape of the wheel —welding the grains into a tough, homogeneous steel forging.

They're rolled

Even more strength and resistance to wear and service damage are worked into the wheel as it is formed to final size and shape on Armco's powerful new wheel rolling mill.



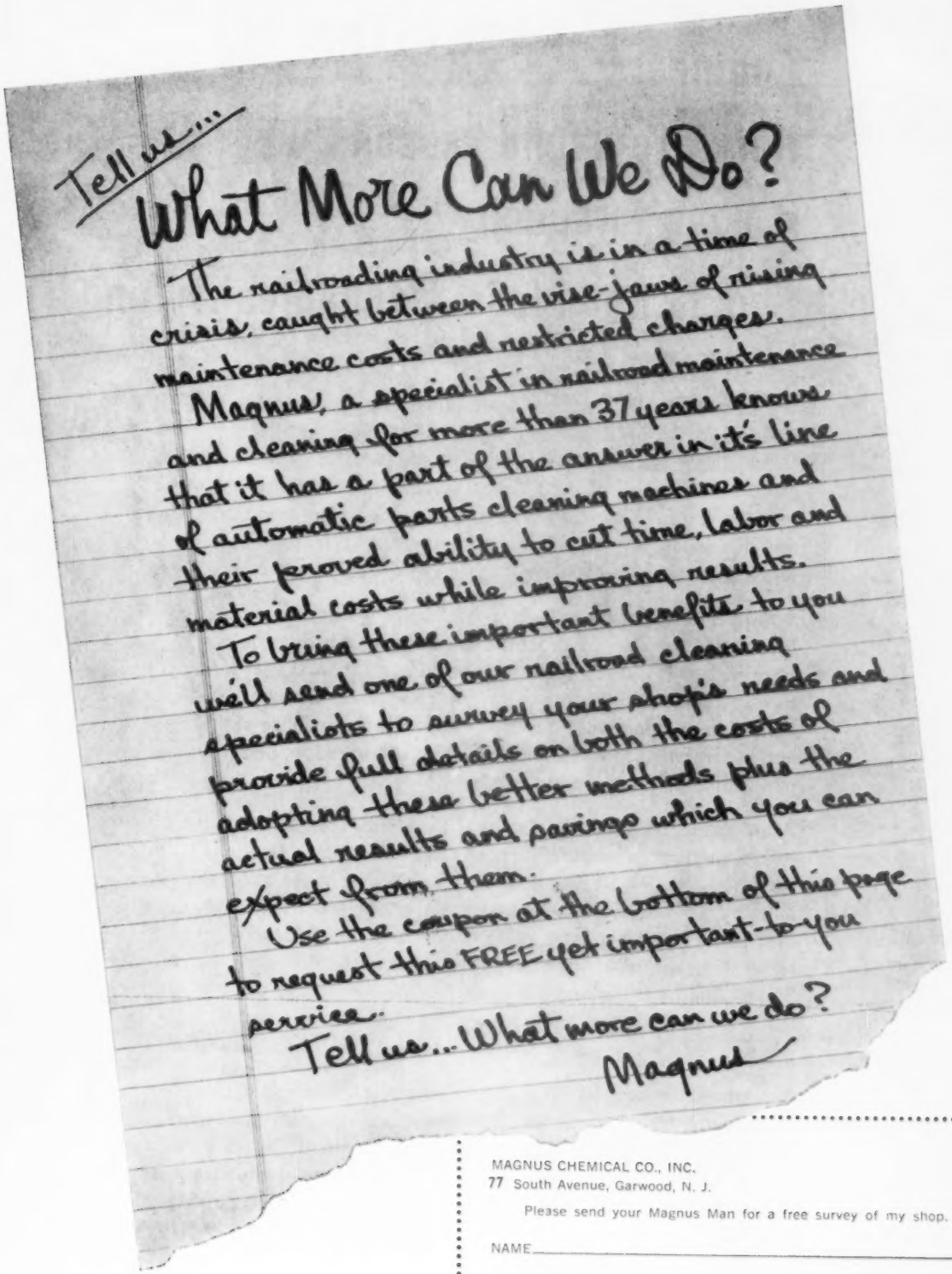
Result: 99.9994% service average

Here's evidence of the dependable service that comes from forging and rolling: Between 1932 and 1957, Armco shipped more than one million one-wear wrought steel wheels. *Only six of these—less than .0006%—have been reported defective.*

For price and delivery information on Armco Wrought Steel Wheels, just call your nearby Armco Sales Office or write: Armco Steel Corporation, 1349 Curtis Street, Middletown, Ohio.

ARMCO STEEL

Armco Division • Sheffield Division • The National Supply Company • Armco Drainage & Metal Products, Inc. • The Armco International Corporation • Union Wire Rope Corporation • Southwest Steel Products



MAGNUS CHEMICAL CO., INC.
77 South Avenue, Garwood, N. J.

Please send your Magnus Man for a free survey of my shop.

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POSITION_____

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CITY_____ STATE_____

Engineers:
Here are sound reasons why it pays to specify
USS Shelby Seamless Mechanical Tubing

USS Shelby Seamless Steel Mechanical Tubing offers you extraordinary freedom of design in a wide range of products from bushings to hydraulically operated telescoping booms. And, Shelby Seamless Tubing helps cut processing costs, because it eliminates drilling operations; enables you to replace drills with simple, less expensive boring tools, and it reduces tool wear and tool changes; and, more important, more uniform parts can be turned out by the hundreds or thousands.

Where Shelby Seamless Tubing is used as a load-carrying member or part, it exhibits a number of structural advantages over other forms. *Here are a few:* it gives you a superior cross section when a part is designed to withstand equal loading in any direction; it resists bending stresses equally in all directions; it is able to absorb and localize shock; and in torsion, it provides better material distribution, and for a given weight, can withstand more load than other sections.

And, of course, the name Shelby is backed by the world's largest and most experienced manufacturer of seamless tubing—National Tube! The production of Shelby Seamless Tubing, from ore to finished product, is entirely controlled by one organization. There is no divided responsibility. Every foot, every length, is made under the careful supervision of skilled men with years of tubemaking experience. For more than 60 years, Shelby Seamless Tubing has been first with men who want the best in mechanical tubing.

You'll find Shelby Seamless Tubing available at select Shelby Distributors throughout the country. These distributors are strategically located and expertly trained in solving all types of tubing problems. Here, you can choose from a complete range of sizes and stocks. If you'd like to find out how Shelby Seamless Tubing can be most effectively applied to your designs, contact your nearest Shelby Distributor . . . *soon!*

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National Tube Division of United States Steel

Columbia-Geneva Steel Division, San Francisco, Pacific Coast Distributors
United States Steel Supply Division · United States Steel Export Company, New York

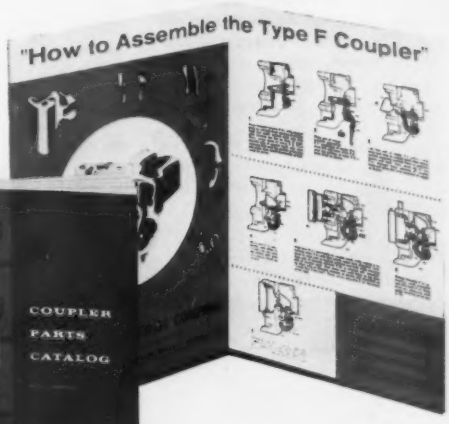
KEYS TO SUCCESSFUL RAILROADING...



NATIONAL

SERVICE AIDS AND RAILROAD PROMOTION

Coupler Assembly Charts are available for Types E, F and H couplers. A new illustrated Coupler Parts Catalog shows photograph of part, part name, part number and approximate weight.



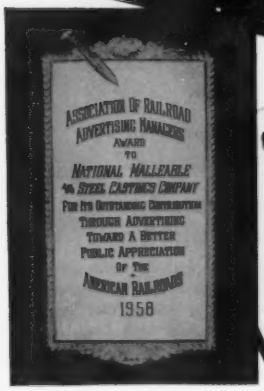




IQ (Impact Quantum) Slide Graph makes it a simple matter to figure total work done in foot-pounds during car impacts without laborious calculations.



Booklet titled "Series Impacts" graphically illustrates impact forces encountered when one car is switched into a string of standing cars.



National's series of advertisements promoting the use of railroad service, appearing in leading traffic publications, has been awarded for the second time the coveted Golden Spike by the Association of Railroad Advertising Managers.

The Railroads are Moving Ahead—with

NATIONAL SPECIALTIES AND SERVICES

Established 1868

NATIONAL MALLEABLE and STEEL CASTINGS COMPANY

COUPLERS • YOKES • DRAFT GEARS • FREIGHT TRUCKS • JOURNAL BOXES

Railway Division Headquarters
Cleveland 6, Ohio

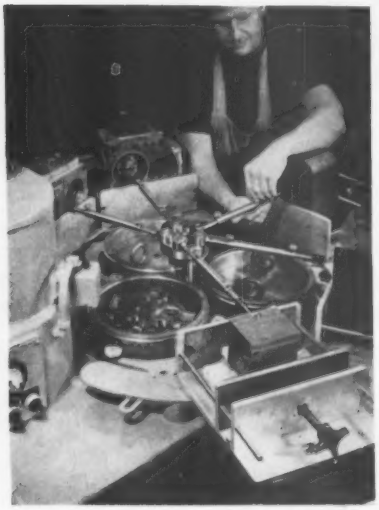
International Division Headquarters
Cleveland 6, Ohio

CANADIAN SUBSIDIARY
National Malleable and Steel Castings Company of Canada, Ltd. • Toronto 1, Ontario

WHAT'S NEW IN EQUIPMENT—*(Continued from page 12)*

petroleum residues from metals and metal parts. It is designed for cold tank use; to break the adhesive bond between soil deposits and metals, and to wet out and hold dirt and soil in suspension. It softens and strips paint from the soiled parts. It will not corrode aluminum, aluminum alloys, or magnesium.

The solvent can be used for many cleaning cycles. It is available in 5- and 55-gal steel drums. *Fine Organics, Inc., Dept. RLC, 205 Main st., Lodi, N.J.*

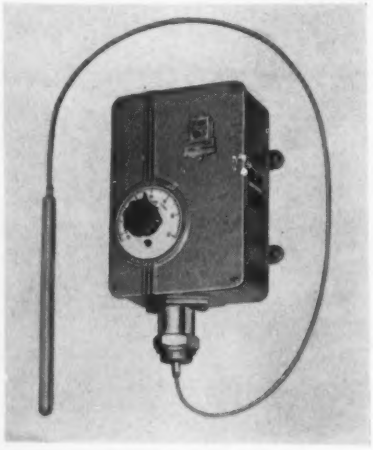


Attachment for Lapping Air-Brake Parts

The Lapmaster Model 24 is equipped with a five-station lapping attachment for lapping of air-brake valves and other air equipment. The fixture is radially mounted and permits lapping of valve faces on lapping table while reciprocating blocks internally lap valve seats. When the small lapping blocks go out of flat, they are brought into perfect flatness by reconditioning on lapping table. *Crane Packing Company, Dept. RLC, Morton Grove, Ill.*

Multi-Stage Temperature Control

The ZC type temperature control, which gives multi-stage cooling or heating, is particularly adapted for use in refrigerator cars as it combines sensitivity and accurate temperature control with resistance to shock and vibration. It is equipped with from two to five switches, each of which may be independently set to operate at any point on the scale. Combinations up to five may be used to refrigerate a space where it is desirable to cut in three separate stages of refrigeration successively on rise of temperature in 2-deg increments and also apply one stage of heating should the temperature drop below the first stage of refrigeration.



The differential setting of the switches remains unchanged as the temperature set pointer is moved up or down on the calibrated dial to the desired operating temperatures. For reefer applications, the control, which is mercury activated, will control at any point between 30 and 120 deg F. *Partlow Corp., 518 Campion Road, Dept. RLC, New Hartford, N.Y.*



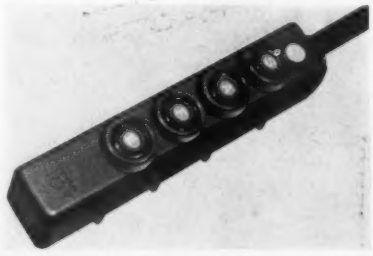
Air-Powered Impactool

The Size 834 reversible Impactool gives 25 per cent more power and runs down nuts and bolts five times faster than previous designs. It spins down nuts with a free speed of 3,500 rpm and delivers 850 impacts per minute. It weighs 19⅞ lb (less socket), is rated to run bolts up to 1¼ in. thread size and has a 1-in. standard square driver. It operates from ¾-in. air hose and has a hose connection pipe tap of ⅜ in. *News Service Dept., Ingersoll-Rand Co., Dept. RLC, 11 Broadway, New York 4.*

Primer for Rusted, Damp Metals

Metalastic, a primer for use as a first coat on metal surfaces, penetrates rusted surfaces to create a tight bond with the underlying metal and works into crevices to insure overall protection for irregularly shaped and rough surfaces. It displaces moisture where present and is said to be an ideal surface for recoating.

The primer will remain flexible in temperatures ranging from 40 deg below zero F to 240 deg F. Coverage is 550 sq ft per gal at a dry film thickness of 2 mils, applied by brush, roller or spray. *Industrial Maintenance Division, Sherwin-Williams Co., Dept. RLC, Cleveland 1.*



Neoprene-Enclosed Push-Button Station

The Joy push-button switch with Neoprene housing is lightweight, waterproof, and non-corrosive. It is about one third the size of a conventional cast-iron unit and is available either in three- or four-button models. Special grommets, supplied with each unit, fit several cable sizes and assure weather tightness.

Each button is an integral part of the housing and completely encloses, by continuous design, the snap-acting switches. A gloved hand can reach the buttons, and a specially designed ring-shroud protects each from accidental action from any lateral direction.

Applications include hoist and crane operations, suspension above heavy machinery, and other areas where non-bulky pendant-type stations are desirable. *Electrical Products Div., Dept. 111, Joy Manufacturing Co., Dept. RLC, 1241 Macklind ave., St. Louis 10, Mo.*

(*Turn to page 54*)

Oakite Mechanized Methods force cleaning costs ...DOWN ...DOWN ...DOWN

...gives you the important advantage...

low-cost end results

If your cleaning practices have kept pace with modern motive power, it's certain they're mechanized. Why? Well, one road spent $5,200 to clean 135 tank cars manually. When they mechanized the job with an Oakite 324 Cleaning Unit, they got faster turnaround, used less material, *saved $1,600.*

Latest materials help, too. A road saved $2,600 *a month* in car-washing costs by up-dating with Oakite Compound No. 88. *And,* they got better, non-streak cleaning... on windows, too.

At one terminal, an Oakite Steam Detergent Gun and Composition No. 72 slashed monthly consumption of material for cleaning diesel interiors from 1,200 pounds to 337 pounds, cut *cost* per month from $144 to $57.63.

Beginning to suspect that a review of your cleaning methods and materials could save you money? Then call in the local Oakite man. Or, write for the Oakite *Manual of Railroad Maintenance Cleaning Procedures.* Oakite Products, Inc., 46 Rector Street, New York 6, N. Y.

SPECIALIZED INDUSTRIAL CLEANING
OAKITE
MATERIALS · METHODS · SERVICE
SCIENCE
In our 50th year



Cut cleaning costs? Solution is "modernize" not "eliminate"



"With maintenance pinched by cost-cutting programs, it could become quite a problem to keep up proper cleaning," says Sterling Killebrew, manager of the Railroad Division of Oakite Products, Inc.

"Reducing cleaning schedules is no answer. Cleaning is necessary from both an 'in-service' and a public relations viewpoint."

A better answer lies in more *effective* cleaning materials and in more *mechanization* of cleaning procedures, Mr. Killebrew said.

"Modern methods can improve car and locomotive appearance and keep up maintenance cleaning *without* adding manhours, and at *substantially lower costs.*" Mr. Killebrew cited several case histories.

Saves $2600 monthly, in car-washing costs

"One road switched from a so-called 'economy' product to an Oakite material in its automatic car washer. The Oakite cleaner loosened road dirt more thoroughly, eliminating costly hand-finishing. Yet, it worked at more dilute concentrations . . . actually *cost $2600 less* for one month's supply.

Mechanization cuts tank car cleaning by $1600

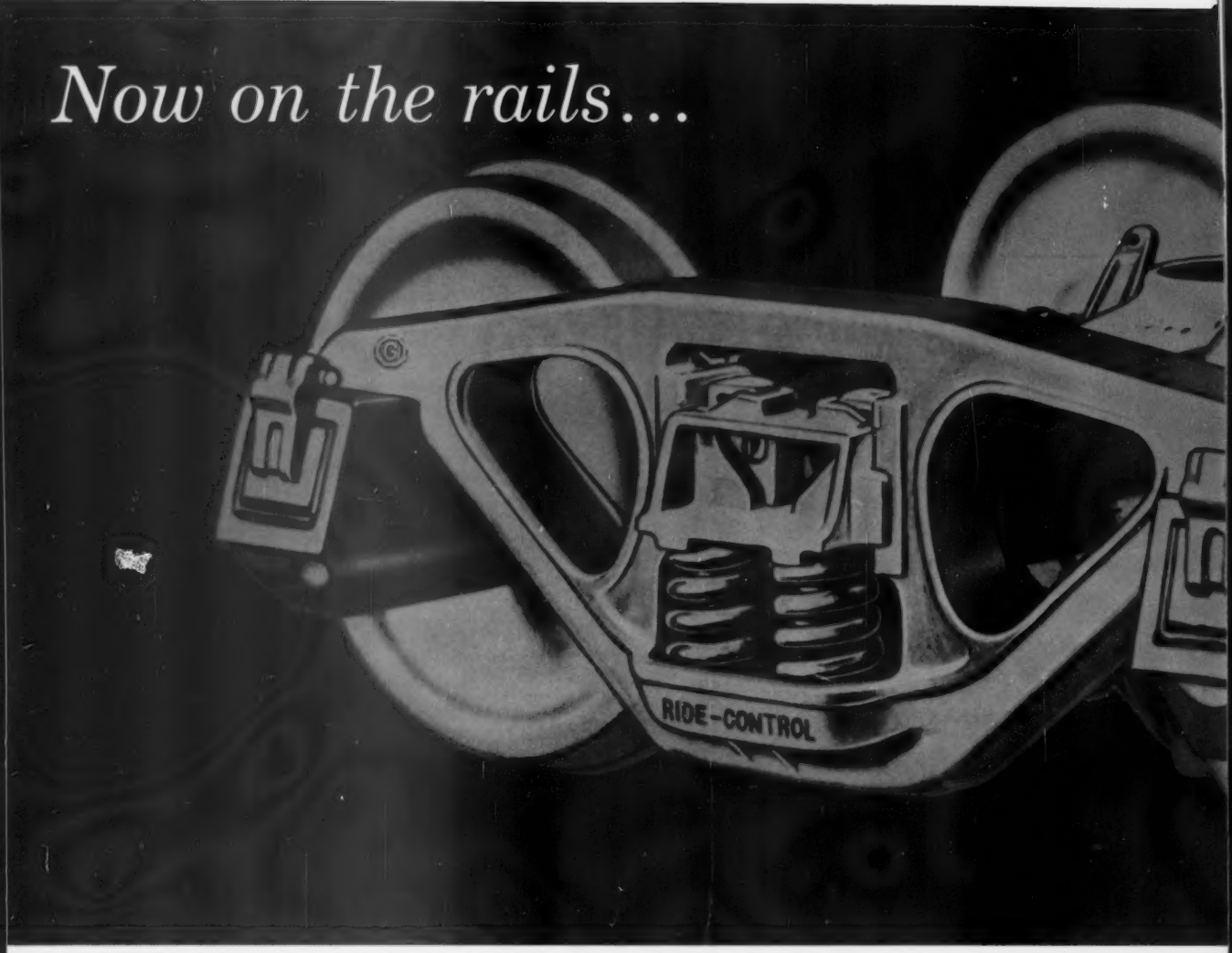
Another line, he said, cleaned 135 tank cars manually for $5200. By mechanizing the job, the same number was cleaned faster, more effectively, and with one-third the material consumption. Cost: $3600.

Quality Cleaner pays off at $800 a month

In a "cost-saving" move, a third road was using an "inexpensive" material for washing diesel exteriors. Cleaning one engine required 20 gallons of high-concentrate cleaning solution. Costing just pennies more per pound, an Oakite material gave them the same cleaning with only 5.6 gallons of low-concentrate solution. Net result: savings of $800 a month using the more "expensive" cleaner.

"Examples like these are common," Mr. Killebrew concluded. "Ask any Oakite man to tell you more."

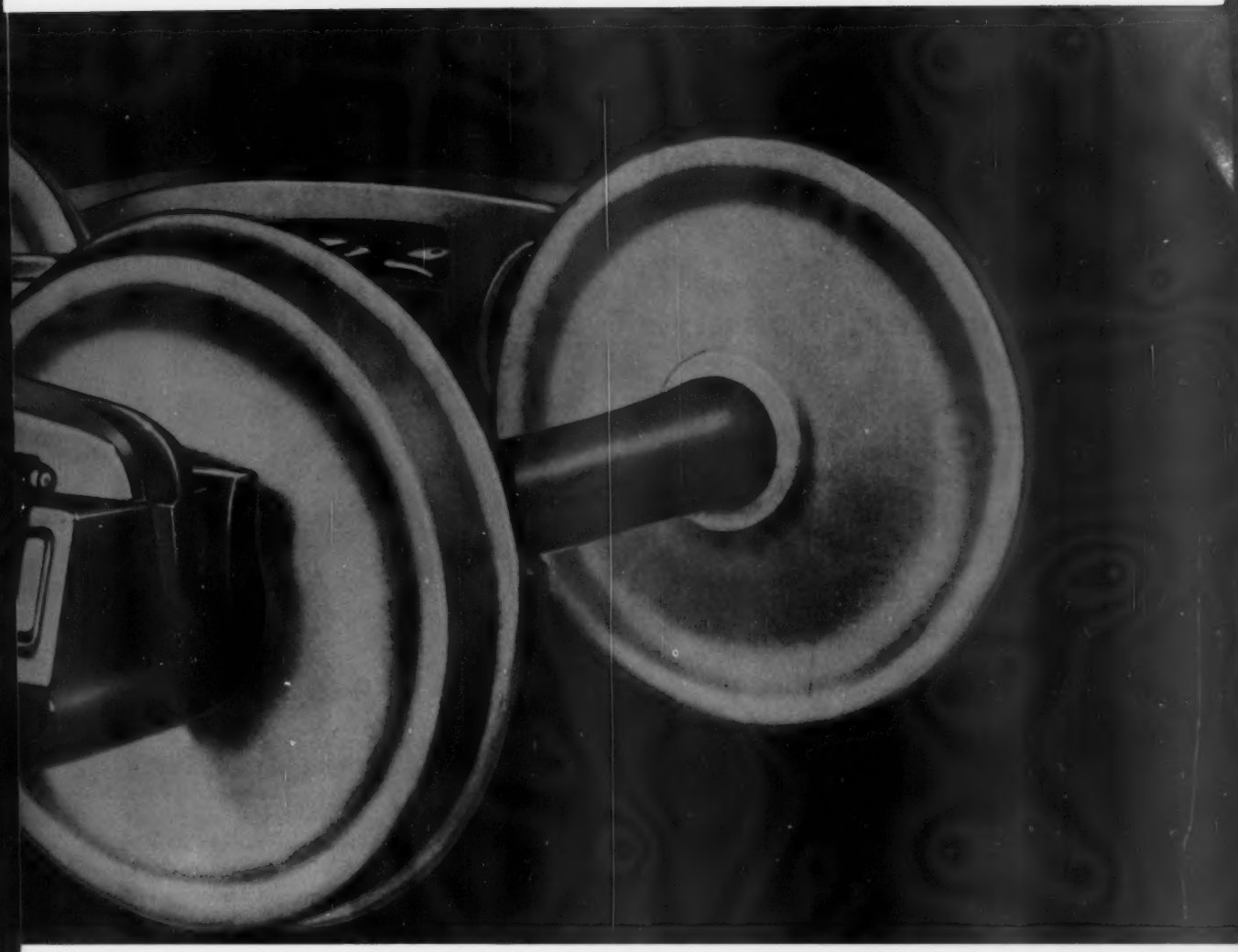
Now on the rails...



the One-Millionth

Here is the truck that has just received its millionth endorsement.

This millionth truck reflects the constant improvements in design and construction of the past 15 years...and it is the forerunner of more improvements which will come from American Steel Foundries in the future.



Ride-Control Truck!

The truck that made modern freight service possible is the

ASF

Ride-Control® Truck

AMERICAN STEEL FOUNDRIES

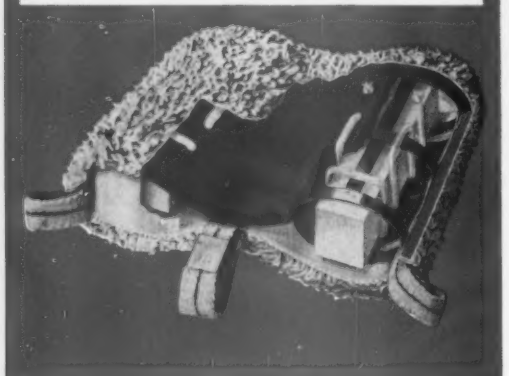
Prudential Plaza, Chicago 1, Illinois

Canadian Manufacturer and Licensee: International Equipment Co., Ltd., Montreal 1, Quebec
Other Foreign Sales: American Steel Foundries, International, S. A., Chicago

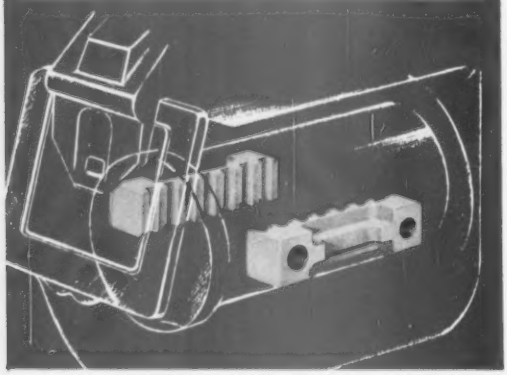
NOW MAGNUS OFFERS THE TRULY ECONOMICAL SOLUTION

to the freight car HOT BOX PROBLEM

MAGNUS LUBRICATOR PADS
provide uninterrupted journal lubrication



***and* R-S JOURNAL STOPS**
stabilize the entire journal box assembly



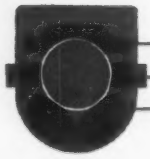
Magnus Lubricator Pads and R-S Journal Stops increase miles per hot box ten times without the need for any major capital investment—give low-cost solid bearings far better performance and economy than was ever possible before

MAGNUS LUBRICATOR PADS wick more oil—hold more oil—stay in firm contact with the journal at all times. Each one-piece twin lobe pad holds more than 2½ times its weight in oil—better than 5.9 pints for the 6″ x 11″ size. And 3-way wicking carries the oil to the journal circumferentially, internally and by center feed. Firm contact is assured by permanently resilient flat springs positively retained in position inside the felt-backed duck cover. You get *constant journal contact*—winter and summer—and minimum pad displacement even in coldest weather.

MAGNUS R-S JOURNAL STOPS have proved their ability to cut hot boxes 90 per cent, double bearing life, reduce wheel flange wear and virtually eliminate dust guard damage. By preventing excessive fore-and-aft movement of the journal within the box, they give the low-cost solid bearing a chance to work at optimum efficiency, not just part of the time, but *all* of the time—even under severe impacts from humping and braking. Journal Stops can be easily installed on any freight car, new or old. And they increase new car costs less than 2%—*pay for themselves* in less than 3 years!

For complete information, write to Magnus Metal Corporation, 111 Broadway, New York 6, or 80 E. Jackson Blvd., Chicago 4.

MAGNUS

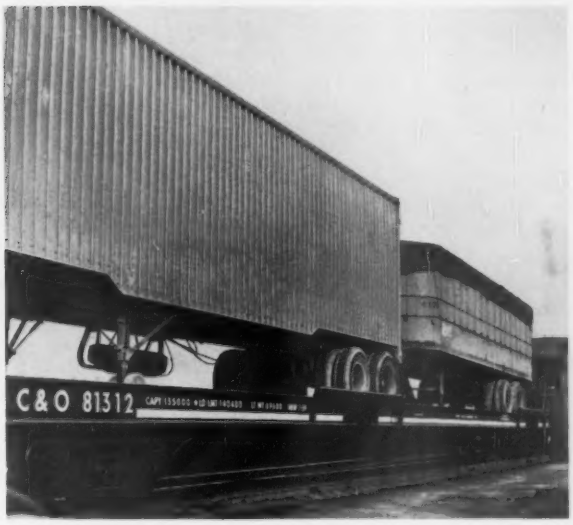


SOLID BEARINGS
R-S JOURNAL STOPS
LUBRICATOR PADS

RAILWAY PROGRESS INSTITUTE MEMBER

MAGNUS METAL CORPORATION *Subsidiary of* **NATIONAL LEAD COMPANY**





The 85-ft trailer flat car has become a necessity as more 40-ft trailers go into service. Cars for Trailer Train (above) are supplementing fleet of 75-ft cars built in 1955. TTX car shown is Pullman-built and is characterized by pressed side sills. Chesapeake & Ohio began piggyback service with cars built by ACF (right).

Extra-Long Piggyback Cars More Popular

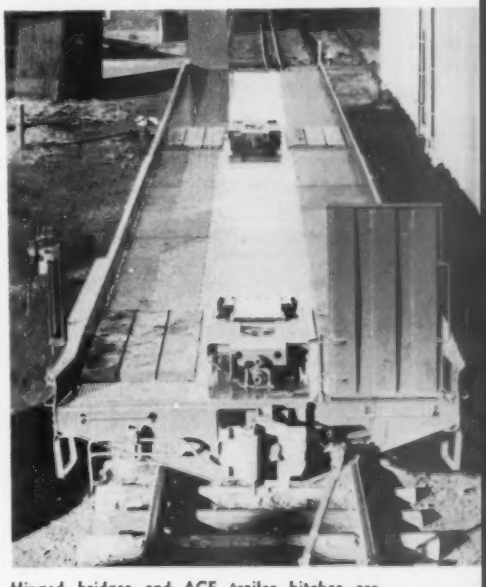
ACF and Pullman building similar 85-ft cars, each of which will handle two 40-ft trailers.

Over one thousand 85-ft piggyback flat cars have rolled out of two car-builders' plants in Pennsylvania during the past five months. The Berwick plant of ACF Industries and the Butler plant of Pullman-Standard have been running these big TOFC cars off their production lines at a fast clip.

Initial and largest orders for these flat cars were those placed by Trailer Train involving a total of 800 units and split evenly between Pullman and ACF. Trailer Train (TTX) is a car line operation owned by U.S. Freight Lines and eleven railroads—Baltimore & Ohio, Boston & Maine, Burlington, Cotton Belt, Frisco, Katy, Missouri Pacific, Norfolk & Western, North Western, Pennsylvania and Wabash. Taking advantage of the production lines and resulting quantity prices, orders for this same type of care were also placed by six individual railroads—Chesapeake & Ohio, Cotton Belt, Denver & Rio Grande Western, Florida East Coast, Union Pacific, and Western Maryland. North American Car Co. has ordered a total of 112 of these cars for lease to other operators.

The cars are 85 ft 8 in. over strikers. Each is to handle two highway trailers which, individually, can be up to 12 ft 6 in. in height, 40 ft in length, and 65,000 lb gross weight. Nominally, these cars are of 70-ton capacity. They are characterized by their long overhang—13 ft 2¼ in. from truck center to coupler pulling face. Uncoupled, they are capable of operating on a 180-ft radius curve, and the specification calls for them to operate coupled with a Pennsylvania caboose on a 375-ft minimum radius curve, or through a No. 8 turnout.

To make this possible, the cars are designed with a 20⅜-in. striker opening for the swivel-shank, Type F interlocking coupler which is standard. This wide striker opening is but one unique feature of the fabricated center sill designs developed by the two car builders. ACF, expressing its philosophy, stated, "We have found from past experience that, when a two-trailer piggyback car is to be designed, the design of the center sill will be most flexible and economical with a built-up, welded type rather than one made



Hinged bridges and ACF trailer hitches are used on all 800 cars built for Trailer Train. This P-S car has 85-ft steel-plate deck.

of rolled shapes. In addition, camber control is more flexible with the built-up welded sill as compared with a rolled-shape sill."

The Pullman-Standard design is based on the use of the built-up center sill and an 85-ft deck plate which extends the length of the car. This deck plate integrates all parts of the load-bearing structure and serves as a center-sill top cover plate, bolster top cover plate, and draft-sill top cover plate. Stringers welded under this deck plate form box sections which are continuous from bolster to bolster. Cross-members are butt welded to the center sill and side sills. These side sills extend above the deck and serve as rub rails for tires and as anchors for trailer safety chains.

While Pullman used a pressed, Z-shape side sill, ACF utilized a rolled channel to perform the same triple functions of structural member, trailer tire guide and chain anchor. The ACF cars have steel deck plates only from the end cross-bearers out to the end sills—a distance of 20 ft 4 in. at each end. There is an additional cross-bearer at the center of the ACF cars. The ACF cars have a wood deck between the center still and the side sills.

The box-type center sills of the two designs are quite similar. Both are fish-belly arrangements 30 in. deep through the center of the car. Webs are 5/16-in. plate. Because there is no steel decking to serve the function between cross-bearers, the ACF car has a 30- x ¾-in. top cover plate on its center sill. Webs are spaced 18 in. apart.

In the draft sill area, the Pullman cars have conventional LAHT Z-26, 41.2-lb AAR center-sill sections with the top flanges welded together. The ends of the ACF cars have 11-11/16-in. deep web plates, 5/16-in. thick, reinforced with a 1-in. bottom cover plate. Both cars use fabricated body bolsters and welded center-sill fillers and strikers.

The side sill and rub rail on the Pullman cars is a 7/16-in. LAHT, fishbelly, pressed Z-shape which is 19 in. deep between bolsters, and is ½-in. thick and 16½-in. deep at the ends. The ACF side sill is composed of three lengths of 15-in., 33.9-lb OH channel which is bent along the web at a point 3 in. above the floor line. There it cants outward to form the rub rail and reaches approximately 8 in. above the floor. Welded splices between the three side-sill segments are at the bolster center lines.

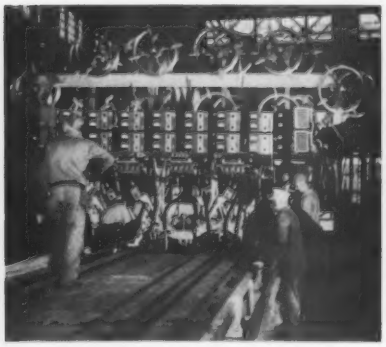
The 7/16-in. deck plate on the Pullman-Standard car is composed of two 40-ft 10-in. x 8-ft 4-in. low-alloy, high-tensile plates welded together and extending from side sill to side sill and from end sill to end sill. It is reinforced by a ⅝-in. plate through the center of the car and is carried over thirteen 6-in. 15.3-lb channels, six of which form cross-bearers when combined with 4 x 3 x ⅜-in. angles that extend to the bottom of the center sill. The end cross-bearers are further strengthened with ⅜-in. web plates. The four stringers under the deck plate and on top of the cross-members are 7-in., 17.6-lb channels extending from bolster to bolster.

The ACF car has three cross-bearers formed from 5/16-in. plate flanged at the bottom. In addition, there are twelve crossties on each side of the center sill which are 5-in., 10-lb I-beams. Running over these and extending between the two end cross-bearers are three 14-lb Z-section stringers on each side of the center sill. These Z's form the entire support from the wooden decking.

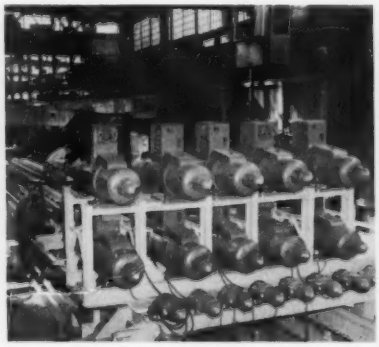
(*Continued on page 39*)

Partial List of Suppliers

Side frames and bolsters	Birdsboro Steel Foundry American Steel Foundries National Malleable & Steel Castings Scullin Steel Symington-Gould
Axles	United States Steel
Wheels	Armco Steel Baldwin-Lima-Hamilton Bethlehem Steel United States Steel
Roller bearings	Hyatt Bearing Division Timken Roller Bearing
Roller bearing adaptors	National Malleable
Truck brake levers	Schaefer Equipment
Springs	Alco Products Henry Miller Spring & Mfg. Union Spring & Mfg.
Ride Control Parts	American Steel Foundries National Malleable
Brake beams	American Steel Foundries Apex Railway Products Buffalo Brake Beam Chicago Railway Equipment
Brake beam wear plates	Pittsburgh Forgings
Brake shoes and keys	American Brake Shoe
Air brake equipment	New York Air Brake Westinghouse Air Brake
Couplers	National Malleable
Coupler yokes	Symington-Gould
Draft gears	W. H. Miner
Hand brakes	National Brake Universal Railway Devices
Slack adjuster	American SAB
Cotter keys	Gustin-Bacon
Branch pipe Tee anchor	Illinois Railway Equipment
Pipe clamps	Central Railway Supply
Trailer hitches	American Car & Foundry
Paint	Pittsburgh Plate Glass



Unit makes ten simultaneous welds applying stringers and reinforcement to deck in 385-ft jig at Pullman Standard plant.



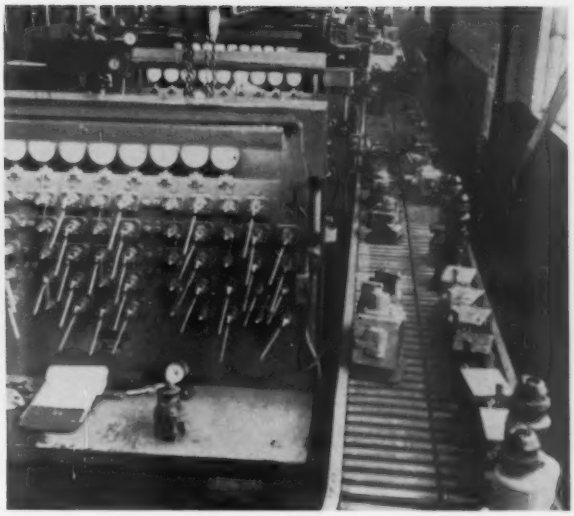
Center sill is placed on deck plate at one of 95-ft stations in big jig. Welding set-ups are among the largest ever built.



Welding of underframe cross-members and brackets is completed by hand with carbody positioned to simplify the work.



Benches for AB portions are similar to those in the locomotive section. Each bench has light, power wrench, and stocks of replacable parts. Old panel filter lining in hoods absorbs spray.



Cleaned and tested portions are placed on conveyor adjacent to test racks. Rack is at work level and little lifting is needed. Portions are disassembled and assembled with impact tools.

Chesapeake & Ohio Facilities Provide . . .

Production Lines for Air Brake Repairs

THE DIESELIZATION of the Chesapeake & Ohio with its resulting increase in the number of locomotive brake portions and components made it necessary to increase the capacity of the air brake shop at the road's Huntington, W. Va., shop. When this was done, however, the entire operation was revamped. What has been produced are a series of smooth-running, high-capacity production lines capable of handling all types of air-brake components used on locomotives, freight cars, and passenger cars. With the same number of employees, production has been increased about 25 per cent.

The shop went into operation during the summer of 1956. Since then, there have been numerous additions to the equipment and refinements of procedures. The shop now cleans about 35 per cent of the locomotive brake equipment, 75 per cent of the passenger-car brake equipment, and some AB freight brakes.

Methods study played a big part and resulted in the following:

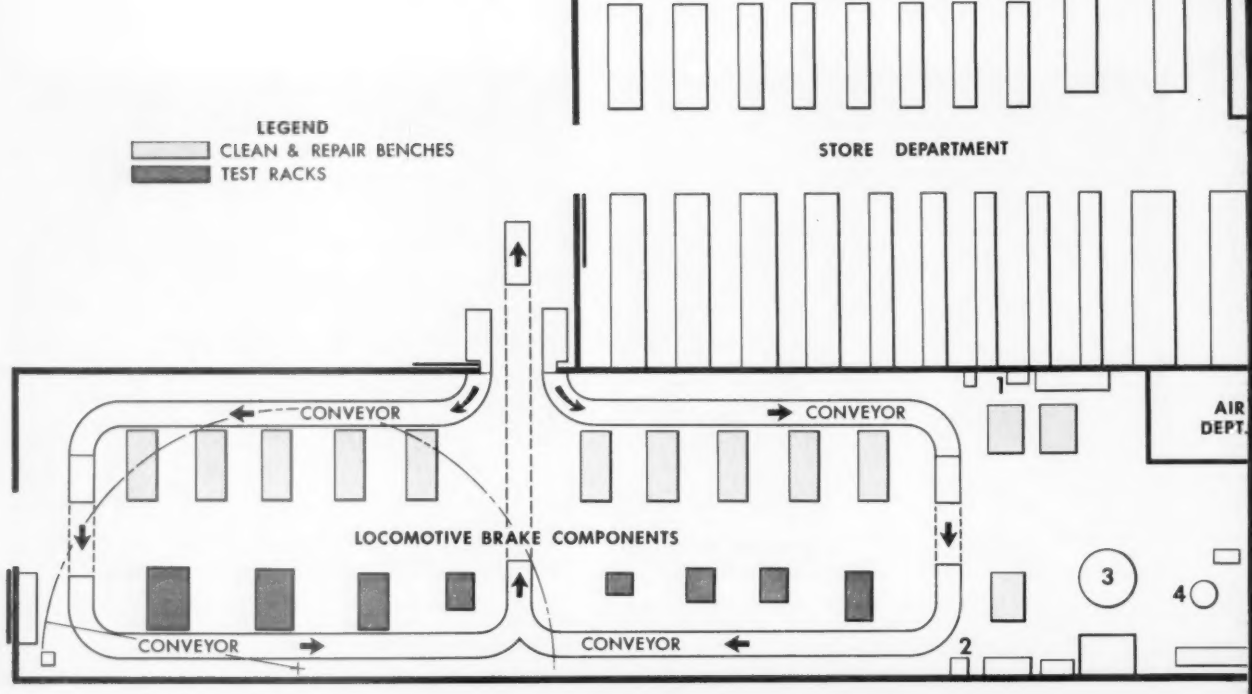
- Work flow is in one direction only.
- Dimensions of the air room are such that an approximate 30 per cent expansion can be made if conditions require it. It is now 25 by 225 ft.
- Lighting and heating are arranged to produce pleasant working conditions. Filtered air flows through the room at all times. A complete air change occurs every three minutes. This change of room air is accomplished by seven exhaust fans located near the ceiling. Air is drawn into the air brake room through diesel car-body filters which are located in the wall opposite the fans.
- Everything possible moves on conveyors to the workman at the bench or test rack. Conveyor height reduces lifting to a minimum. The conveyor is used for storage between successive operations.
- Pneumatic wrenches are used both on test racks and benches for rapid removal and application of nuts and cap screws. These pneumatic tools are checked frequently for proper torque value.
- Stools are provided so workmen can sit while performing tasks that can be done as well sitting as standing. Much has been done to reduce the noise level to a point where it should not be fatiguing.

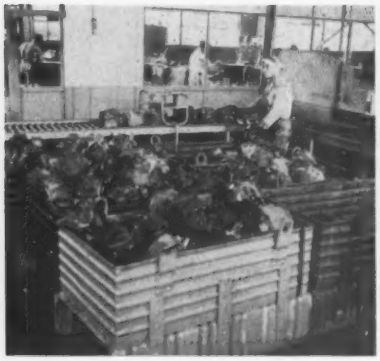
Cleanliness Emphasized

The air-brake shop was formerly on a third floor balcony of the locomotive shop. Along with the problems of transporting portions to and from this location, the site was subject to dust and fumes rising from various shop operations. C&O officers say that one factor in the 25 per cent increase in production with the same manpower has been that there is less reworking because there is less dirt in the enclosed first floor location.

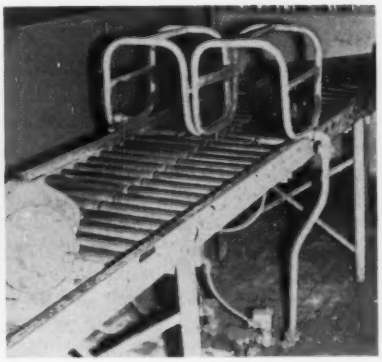
The enclosure for this shop is formed with glass and enameled metal partitions. The areas of glass require no painting and these smooth walls will not hold dirt. Nothing is located against these partitions or against the outside wall, except the washing facilities. This means that there are no spots which cannot be cleaned and no spots to collect dirt. Benches are open at the bottom for the same reasons. The floor of industrial tile is not only more comfortable to stand on, but can readily be cleaned with a commercial vacuum sweeper to keep down dust. Rubber gloves and protective creams are provided where solvents are used in cleaning valve parts. It has been found that by providing clean and pleasant working conditions, everyone has the incentive to keep the working area much cleaner.

Although the test rack operators are able to test any portion of the air brake equipment, the usual practice is to have a particular rack operator specialize in testing three to five different portions day after day.

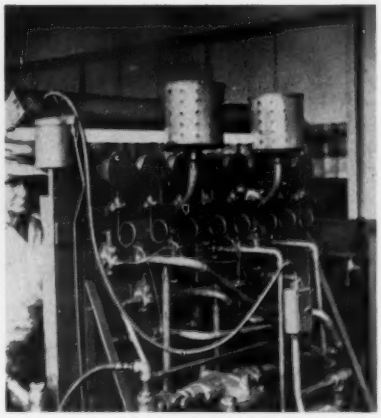




AB valves, shipped to shop in skids, are placed on conveyors for movement. Device at back cleans portions.



Passage of brake portion through pipe arch activates limit switches, causing jets of air to blow excess dirt from valve outside shop.



Muffler at back of test rack helps keep shop noise level down. Test racks are fitted with fluorescent lamps.

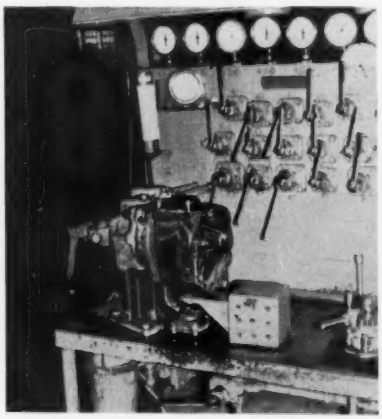
This way he becomes familiar with the portions and very adept at trouble shooting on the portions which are assigned to him. Portions are normally tested on the test rack by somebody other than the man who cleaned and repaired them. Proper testing assures successful performance. In the car brake section, there are two cleaning benches and one repair bench for each test rack. In the locomotive brake area, there are two repair benches for each test rack. Most of the benches are not specialized and could handle a variety of portions, although they are normally being used for working the same group of brake portions. It is C&O practice to use a proper vise for holding portions during assembly and disassembly instead of developing specialized jigs.

Air-operated steam locomotive cross compound air pumps produce pressures of up to 150 psi and supply all the brake shop air demands. This separate air system is not subject to pressure variations, and pressures considerably higher than the 100 to 110 psi shop air supply are available.

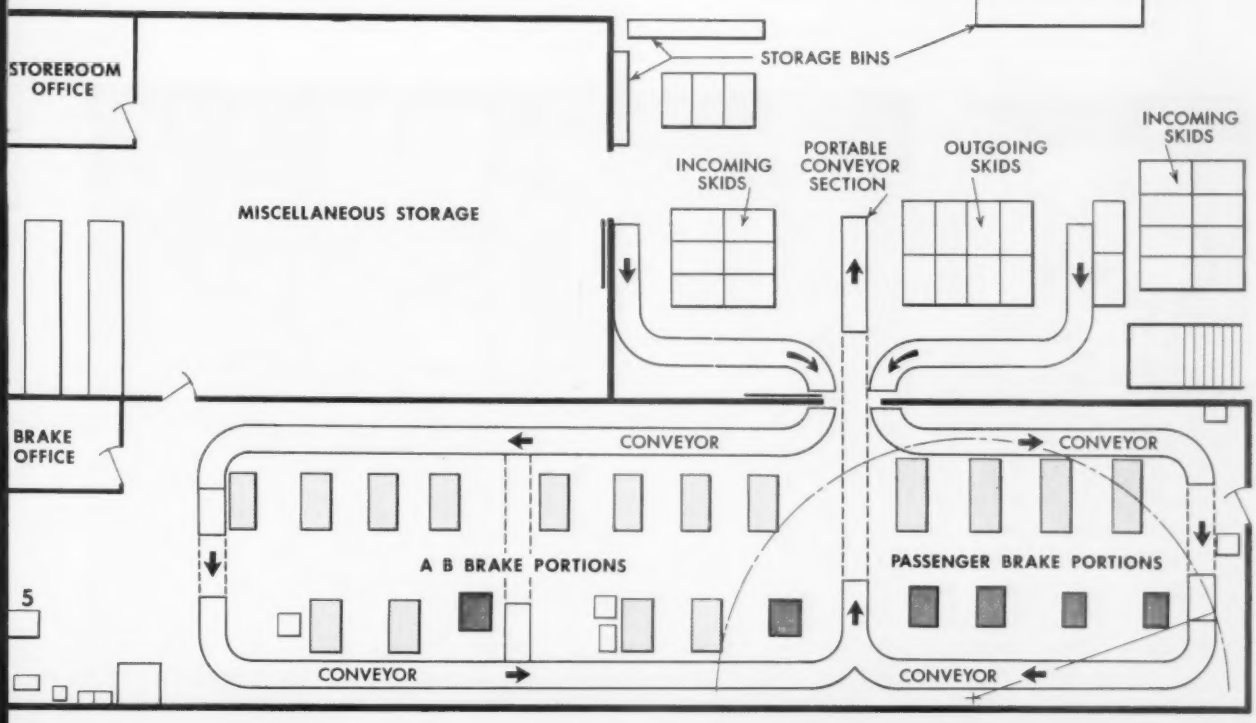
Stores Problems

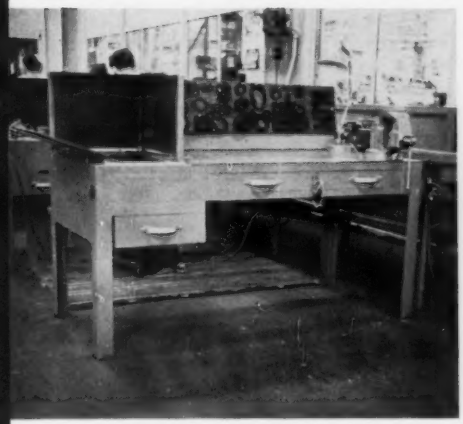
At the same time that the new air brake room was built, the stores department air brake section was moved into the area in the shop adjacent to the air brake room. Today, the air brake room and stores department air brake section share a common wall. A "dutch" door is used for

(*Continued on page 52*)

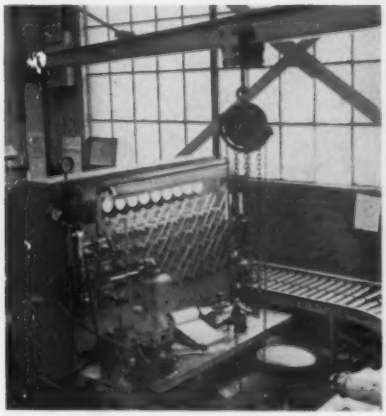


Toggle clamp replaces original screw clamp on test rack. Muffler over this portion's exhaust cuts sound level in the shop.





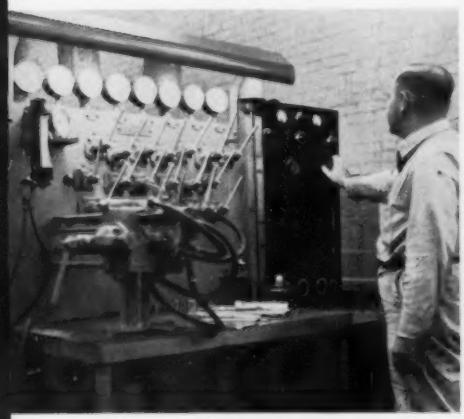
Bench has peg board with gaskets normally used in routine cleaning. Solvent tank, drain board and hood are at left.



Locomotive portion test rack, Type 4C, is located under jib crane which can be used to maneuver heavy portions for test.



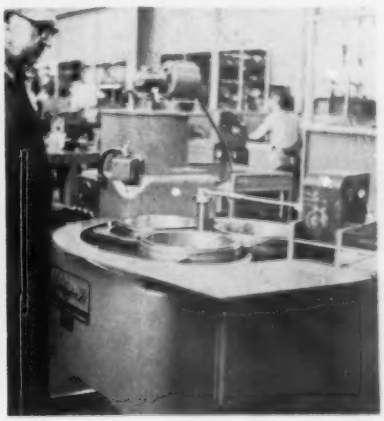
Gages—oil pressure, liquid level and others, as well as air-brake gages—are repaired and calibrated at special benches.



AB test rack in locomotive section has been equipped with electrical panel for testing magnet valves and similar solenoid devices.



C&O designed lapping machine makes it possible to lap six AB slide valve seats simultaneously and accurately.



Crane Lapmaster is used for lapping many brake parts, such as the slide valves. Shop illumination level is 50 foot candles.



Jim walked away; Pete was consoling himself; everybody makes a mistake now and then.

Off Again—On Again

By Ken Wright

ONE MORNING as Pete arrived on the job, he was met by his boss, Big Jim. "Pete, you can pick the darndest days to lay off! Normally it would be all right," Jim said, "but we ran into trouble yesterday with another mechanical refrigerator car and, of course, you weren't here.

"We were working the pre-trip inspection on this car," Jim went on, "and when we started the 'Pull-down' test, it went along all right until we got down to cycling temperature. The temperature was —10 deg and the compressor cycled off. But then it cut right back in. It kept cycling on and off, and we finally shut the engine down when the temperature reached 15 below. I want you to get on this job and let me know as soon as you can whether you can fix it. Do you want some one to help you?"

"Always something!" growled Pete. "Pete, do this; Pete, do that. You sound like my wife. No, I don't need anybody to help me. If you have someone who needs experience, send him along. Who worked on it yesterday?" asked Pete.

"I'll give you Lefty," Jim decided; "You said he needed experience. Tony made the pre-trip inspection on the car," he added.

Before Pete looked at the ailing reefer, he went to Tony and questioned him. "Tony, on that car you had the trouble with yesterday, did you notice any unusual condition up until the compressor started cycling?"

"Nope," replied Tony. "Everything seemed to be all right. I assumed it was a defective thermostat."

When Pete arrived at the car, Lefty was already there. "Lefty," Pete explained, "this car has the compressor cycling on and off after the thermostat is apparently satisfied. Let's look at the wiring diagram, and find just what contacts are in the compressor circuit. Maybe that will give us a lead. Tony thinks it is a defective thermostat."

In tracing the circuit on the wiring diagram found inside the electric cabinet, they discovered that there were only two contacts in the compressor circuit. A normally closed contact of the High Pressure switch and a normally open contact of the Low Pressure switch.

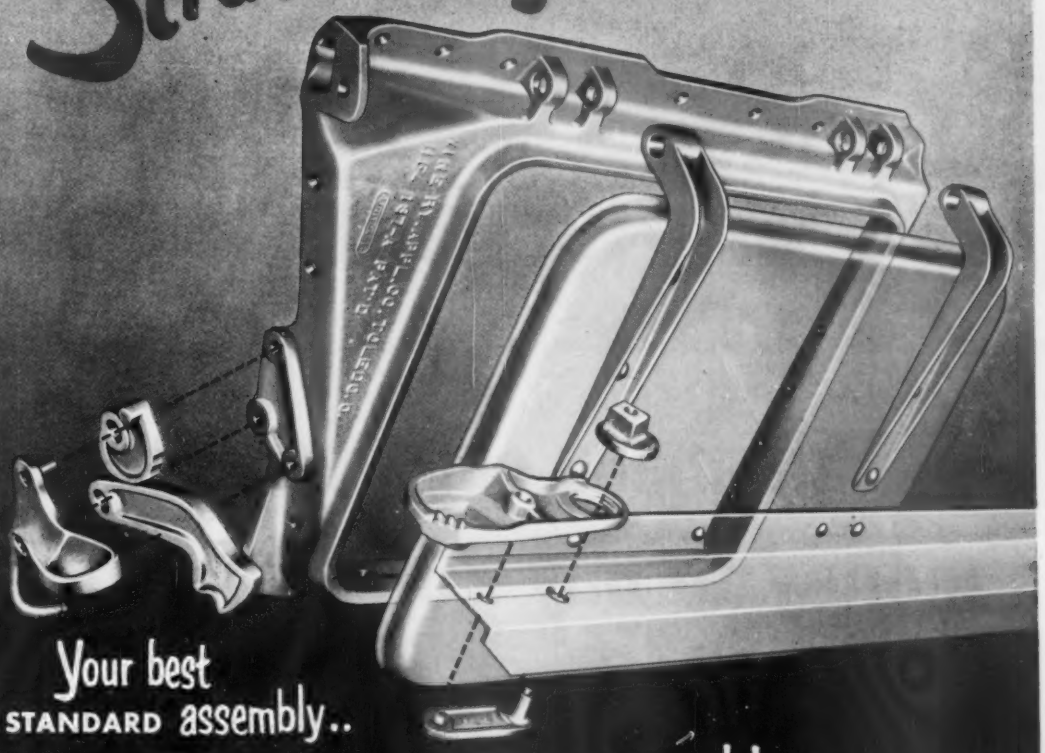
"But Pete," Lefty exclaimed, "I thought the thermostat stopped the compressor. Doesn't this compressor stop and start under the control of the thermostat?"

"Yes, it does," Pete answered, "but not directly in this case. If you notice, the thermostat contact is in the circuit to the liquid solenoid valve. That means that when the thermostat is satisfied, it breaks the circuit to the liquid solenoid valve and causes it to close. The compressor continues to run until it has pumped all of the liquid refrigerant out of the line beyond the solenoid valve. When the pressure has been lowered to the setting of the low pressure switch, its contact opens and that breaks the circuit to the compressor contactor stopping the compressor."

(*Continued on page 34*)

CORRELATED UNITS MAKE HOPPERS

Structurally sound..



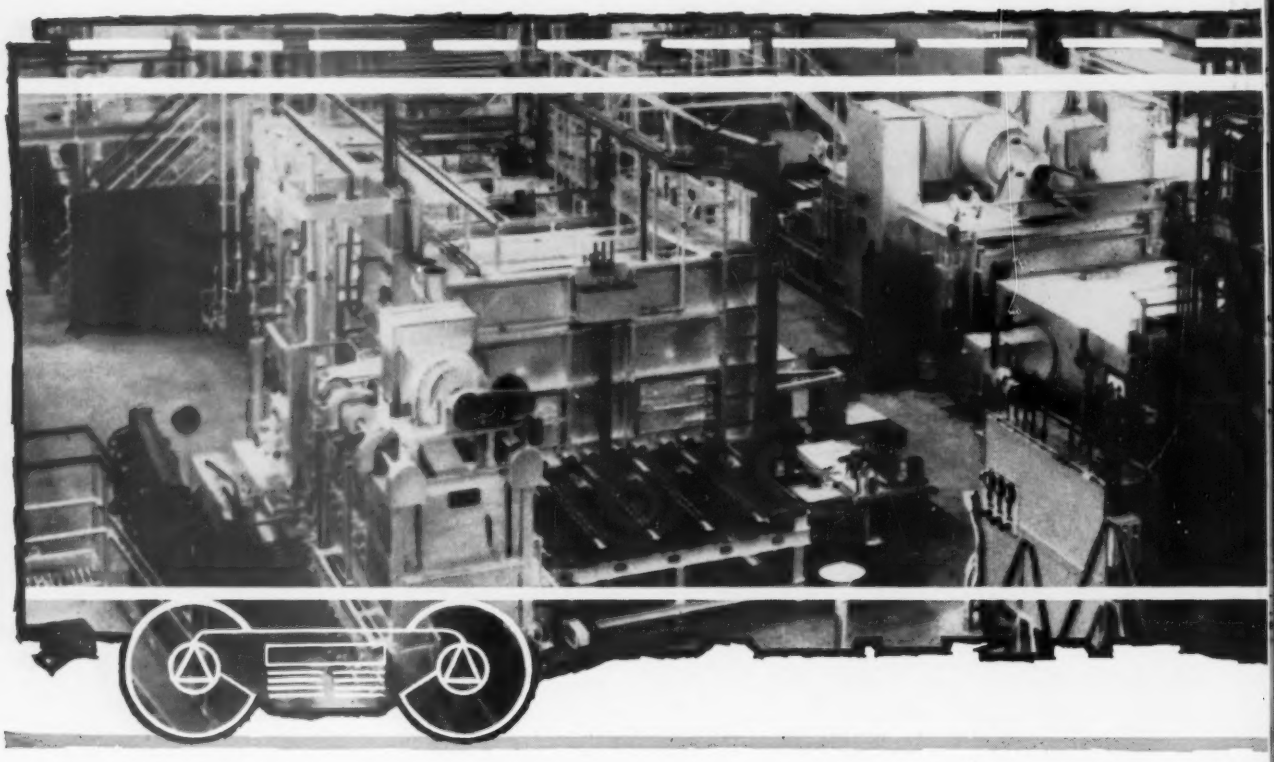
Your best STANDARD assembly..

All cast steel!

WINE

Hopper Frames, Adjustable Locks and Hinges

THE WINE RAILWAY APPLIANCE CO., TOLEDO 9, OHIO



This plant can start saving the money to buy 25,000 new freight

THIS new Timken® roller bearing plant in Columbus, Ohio, is ready now to turn out 20,000 car-sets of freight car roller bearings a year. It's a good start toward making all freight "Roller Freight". And when all freight *is* "Roller Freight", the railroads will save a whopping $288,000,000 in operating and maintenance costs *every year!* That's enough to buy, for example, about 25,000 new freight cars—and start the railroads modernizing where it counts most—in rolling stock.

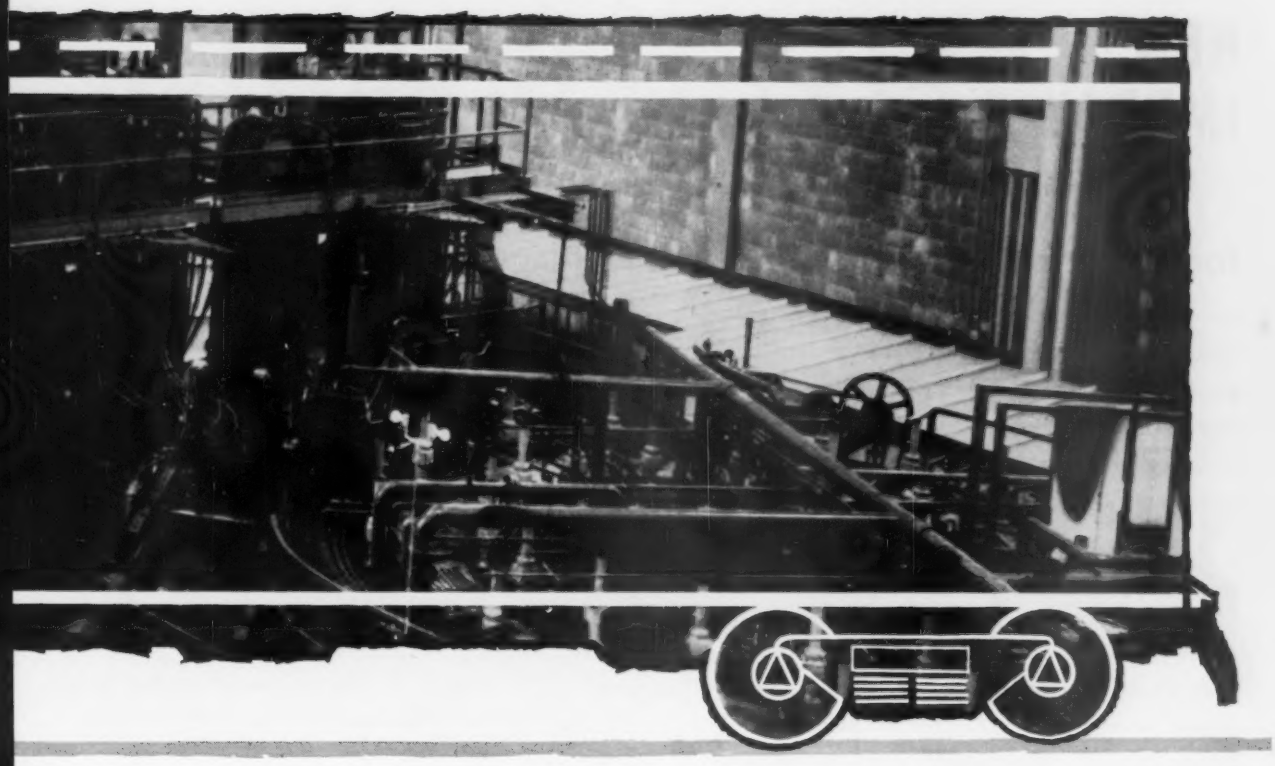
Here's a plan to do the job

The railroads can team up right now as they have in the past on big improvements. Plan their annual roller bearing purchases. This will start their savings rolling. Furthermore, with this plant in full production, bearing costs will be held to a minimum. And with bearing industry expansion, all freight can go "Roller Freight" within 15 years.

By ordering a specified number of roller bearings, the railroads can go "Roller Freight" with an equitable proportion of cars yearly. And by sharing these cars in interchange, all the railroads will get full benefits sooner . . . will earn a fair share of the return on their investment. By starting this plan now the railroads can end the hot box problem by 1974, once and for all!

Your big benefits are: 1) Keeping bearing costs at a minimum by putting new freight cars on roller bearings regularly; and, 2) Earning further savings because you can set up more economical shop schedules for conversion of existing cars to roller bearings.

And add this factor. The costs of friction bearings and other things railroads use have climbed steadily. But the cost of Timken freight car bearings is less than it was 10 years ago! And the savings of full production at this unique plant will help *hold* roller bearing costs



railroads enough cars a year!

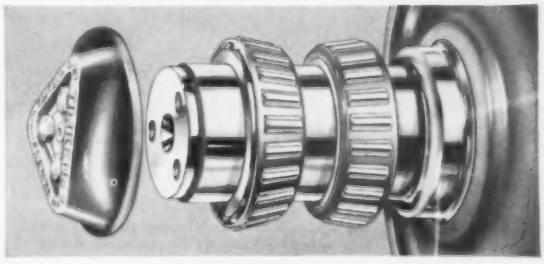
down—make it more practical than ever to go "Roller Freight".

Already 81 railroads and other car owners have over 32,000 freight cars on Timken tapered roller bearings. And savings grow as more new and older cars go on Timken bearings. Why not talk it over with other railroaders—start *now* on your "Roller Freight" plan? The Timken Roller Bearing Company, Canton 6, Ohio. Canadian plant: St. Thomas, Ontario. Cable: "TIMROSCO". *Makers of Tapered Roller Bearings, Fine Alloy Steels and Removable Rock Bits.*

Proof of performance

...Records show Timken bearings average 79,000,000 car-miles per overheated bearing compared to only 182,000 miles per setout for friction bearings.

The **TAPER** *makes Timken the only journal bearing that delivers maximum economies.*



BETTER-NESS rolls on

TIMKEN®

tapered roller bearings

First in bearings for 60 years

NEW IMPROVED ELECTRO-MOTIVE

Increased Capacity

Short time ratings are greatly improved to the extent that insulation destruction is virtually impossible in Electro-Motive's new improved D-47 traction motor. Major improvements in insulation, stator coils, ventilation and power cables provide extra capacity without an increase in motor size.

Reduced Maintenance

A new stator baffling arrangement assures complete cooling of both armature and stator to extend service life and reduce maintenance. Stator coils are precision-fitted to frames, thus eliminating coil shifting and resultant wear on insulation. In addition, the new trapezoidal trunnion pinion end bearing has a far longer life than any previous type of pinion end bearing.

Longer Service Life

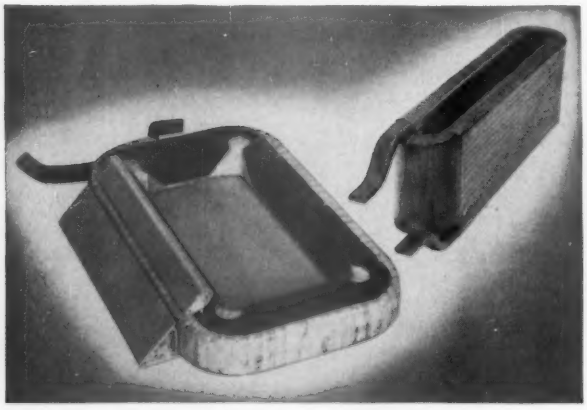
Among the significant improvements in the D-47 motor is the application of an epoxy resin coating over the commutator end wire bands to insulate against flashover damage. More than 3000 motors are now in service with this insulation—not one has reported flashover damage to band wires.

* * *

Older model (D-7, D-17, D-27 and D-37) traction motors can be turned in on the purchase of modern D-47 motors.

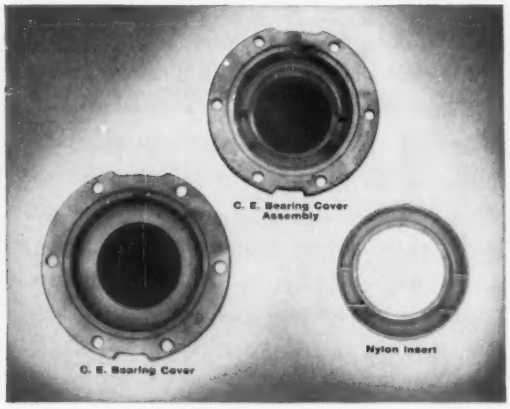
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GENERAL MOTORS LOCOMOTIVES



MAIN AND INTERPOLE COILS

Increased copper to increase load capacity. Silicone insulation for cooler operation. Full-length aluminum baffles for greater strength.

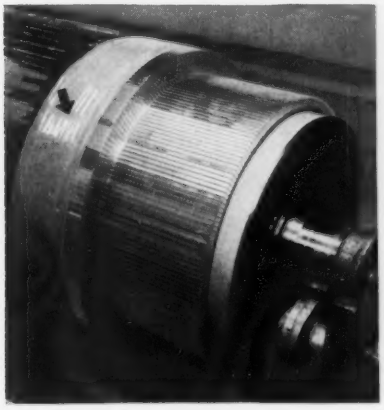


NYLON INSERT FOR C.E. BEARING

Sectionalized nylon insert for commutator end bearing prevents breakdown of lubricating grease. Longer-lasting grease lowers maintenance.

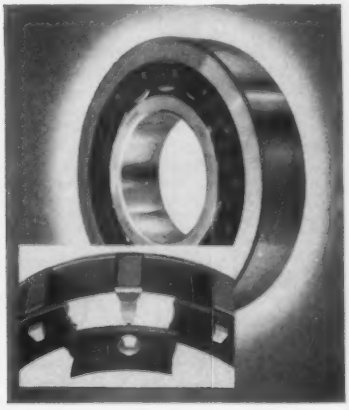
D-47 TRACTION MOTOR





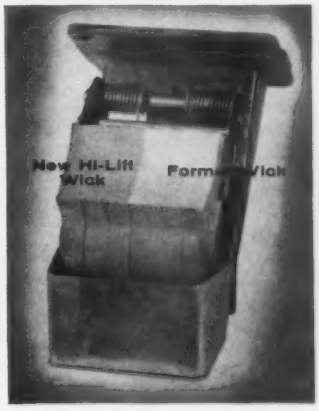
COMMUTATOR END WIRE BANDS

Coated with glass and epoxy resin to eliminate flashover damage. Epoxy coating has excellent insulating qualities and high adhesion strength to withstand stress and vibration.



PINION END ARMATURE BEARING

Trapezoidal shape of trunnion portion of bearing cage imparts far greater strength.



HI-LIFT WICK LUBRICATOR

Felt is laminated with protein material to produce high capillary action. Hi-lift wick provides complete lubrication with first turn of axle under heavy load conditions.

Off Again–

(*Continued from page 28*)

"Well, the trouble could still be in the thermostat, couldn't it?"

"Yes, it could be," Pete admitted, "But it could also be that the solenoid valve is not closing completely."

"How would that cause the compressor to cycle?"

"Well," Pete went on, "When the thermostat does cause the solenoid valve to close, this shuts off the liquid refrigerant. Suppose now that the valve did not close tightly and leaked some liquid through. The compresor might still be able to pump the system down—depending, of course, on the size of the leak.

"If it did succeed in pumping down, the system wouldnt stay that way because the leak would raise the pressure on the low side and the low pressure switch would again close and start the compressor. Therefore, the leak would cause the compressor to cycle on and off."

"But we still don't know for sure whether it is the thermostat or the solenoid valve. How are we going to tell?" Lefty looked puzzled.

"On this system, we'll do it one way. On other systems, we might have to do it differently. The main thing is that we must have the solenoid valve closed and then see if the compressor will pump down. If it does, we can try to determine if the valve is leaking."

As they started the engine, Pete pointed out the refrigeration switch with its three positions—*Refrigeration, Pump-Out,* and *off*. "After we get the engine running, we'll put this switch in the *Pump-Out* position and that should close the solenoid valve. If the compressor cycles with the switch in this position, we can then check the solenoid, because the pump-out position does cause the solenoid valve to close."

"I thought that the only reason for pump-out was to open the system for repairs," said Lefty. "Why does this system pump out every time the thermostat cycles the equipment off?"

"There are possibly two reasons. One is that if the thermostat simply stopped the compressor, a large colume of liquid refrigerant would remain in the evaporator. This liquid refrigerant could then find its way down into the compressor. If the compressor is loaded with incompressible liquid when it is started, pistons and cylinder heads would be damaged."

"The second reason," Pete continued, "is that liquid remaining in the evaporator will continue to evaporate and raise the suction pressure. Increased suction pressure could, in time, impose a terrific overload on the compressor at start-up. Pump-down takes this liquid out of the evaporator and prevents either condition."

"If I understood you correctly during our class sessions, the system on the other types of cars won't do this? Right?" Lefty asked.

"Not generally," replied Pete, "although there is a group of cars operated by one company which would, except that they have a lock out circuit to prevent cycling. That system will pump-down only once, and then the compressor is stopped. The compressor will not start up until the thermostat again calls for cooling. A difference in the thinking of the engineers who designed the systems produced these variations. In some cases, the overload on the compressor is prevented by a Crankcase Pressure Regulating Valve which limits the suction pressure."

"Cycling of the compressor should normally be thermostat trouble only?" Lefty asked.

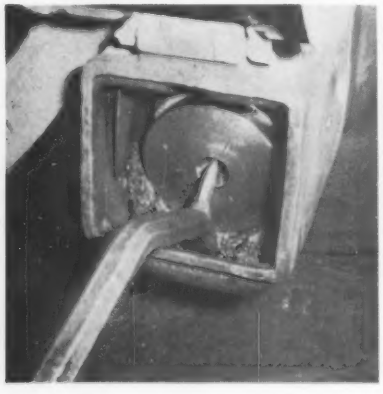
"Not entirely—only when the inside temperature is at the thermostat setting," Pete responded. "If you were not near the thermostat setting and the equipment was cycling, it could be caused by high head pressure or low suction pressure."

By this time the engine was running, and the refrigeration switch had been placed in the *Pump-Out* position. The compressor again began to

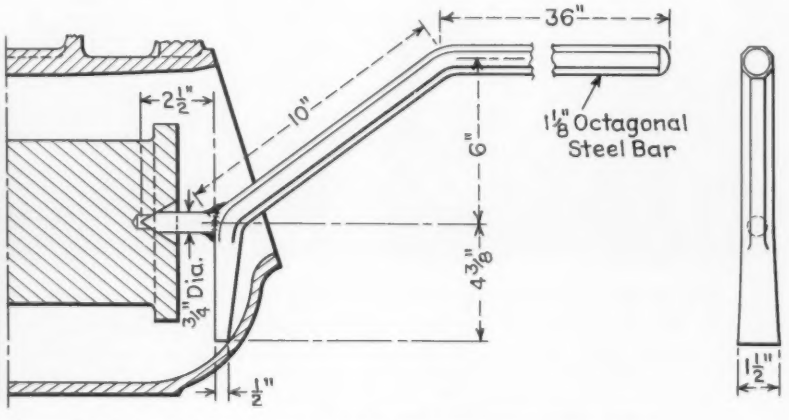
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DM&IR Journal Box Tool

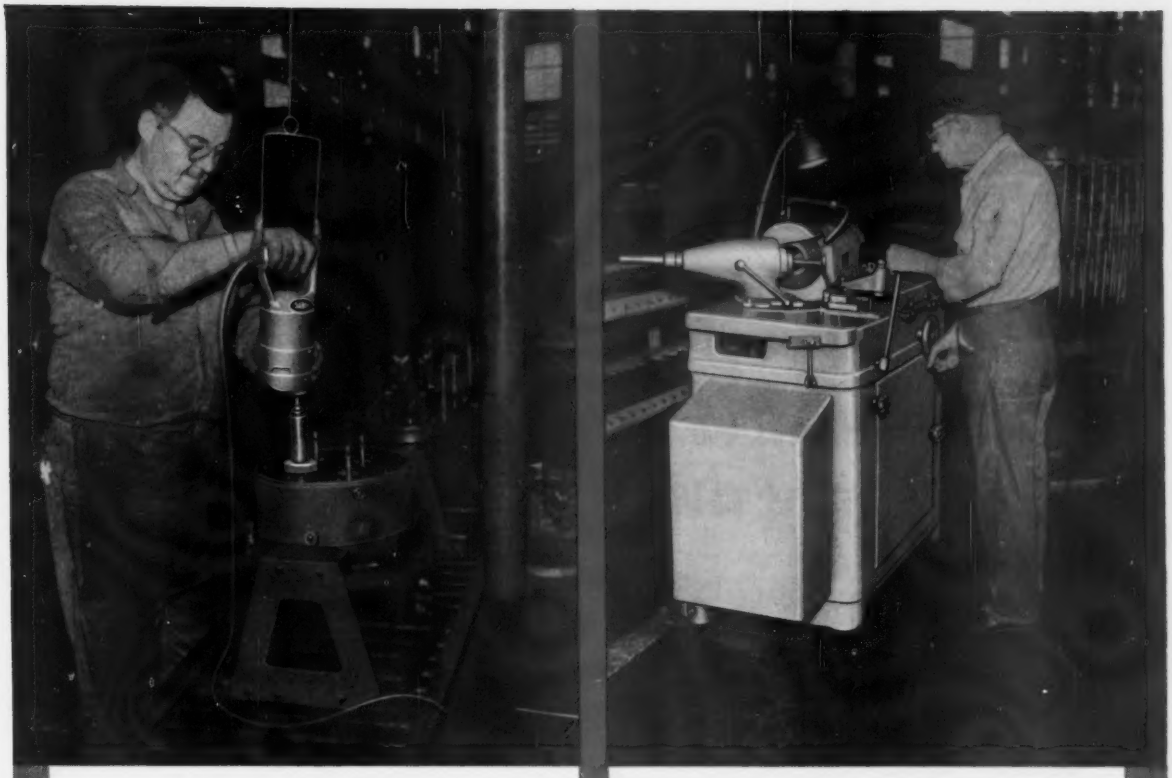
This journal-box moving tool, developed by the Duluth, Missabe & Iron Range, forces the journal box outward to give maximum clearance between the axle collar and the bottom of the box for the application of a lubricator pad. Leverage is gained by hooking the lower prong into the bottom of the journal box and the other into the axle center. A lifting motion at the end of the bar forces the side frame outward to produce the maximum clearance, making lubricator application easier. The tool is formed, as illustrated, from a 1⅛-in. octagonal steel bar 4 ft long. The axle center prong is then welded in place.



Tool is easy to use.



Octagonal steel bar is shaped to form basic tool but pointed prong must be added.



CONVEYOR AND SIOUX SPEED VALVE GRINDING!

Pictured above, left, is a scene in the Chesapeake & Ohio Railroad, Huntington, West Virginia, Diesel Locomotive Shop. The operator is using a SIOUX Heavy Duty Portable Driver, and a SIOUX Stone Grinding E.M.D. Liner Head Valve Seats. The SIOUX Driver is lowered from a retractor hanger. Liner Heads are held in shop-made positioners which are moved along the assembly line conveyor.

Diesel Engine manufacturers recommend SIOUX Valve Seat Grinding Equipment. Factory approved sets include Allis-Chalmers, American-Locomotive, Baldwin Locomotive, Case Tractor, Cooper Bessemer, General Motors Corp., Hercules Engines, International Harvester Trucks and Tractors, John Deere Tractor, Massey-Harris Tractor, Minneapolis-Moline Tractor, National Supply, Oliver Tractors, Onan Engines, Reo Motors, White Motor Trucks.

The new Spline Drive now being supplied, gives from ten to twenty times the life of the hex drive, and is more accurate.

A SIOUX 682L Valve Face Grinding Machine is shown above, right, in operation in the Chesapeake & Ohio Railroad, Huntington, West Virginia, Diesel Shop.

More SIOUX *Valve Grinding Machines are in use than all other kinds combined.* No other machine compares with the SIOUX 682L in ruggedness, precision, and ability to do the big jobs.

Your nearest SIOUX Distributor is listed in the yellow pages under "Portable Electric Tools".

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to lengthen car life, lower maintenance and claims, raise loading flexibility



Repeated nailings of grain doors will not weaken Nailable Steel Doorposts. Cars can stay in revenue service longer, and carry all types of lading.

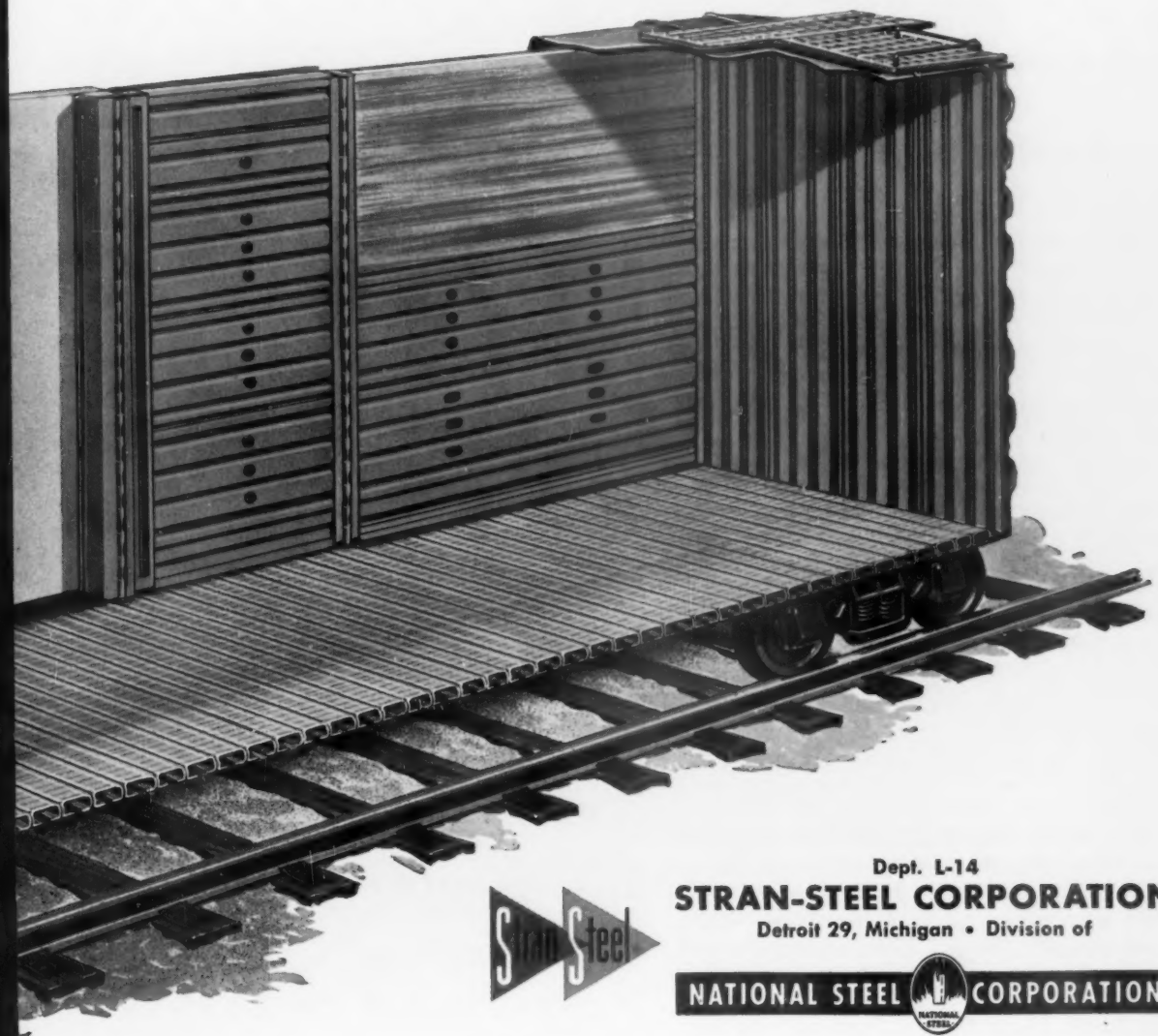
Since its introduction 12 years ago, **N-S-F**, the original **NAILABLE STEEL FLOORING**, has been put to work in more than 60,000 freight cars by 62 leading railroads. Now, Stran-Steel Corporation has developed two new companion products to help you get still more miles of Class A service from new and rebuilt rolling stock.

STRAN-STEEL ANCHOR LINER circles the car with a corrugated wall of GLX-W high-strength steel that reduces dead weight, compared to ordinary carbon steel liners of equal strength. Side heights are variable, with full height on the ends to strengthen these areas substantially and protect against bowing. Integrated with the liner are dozens of recessed strap anchors for fast, safe strapping. Since wooden sidewalls and decking are responsible for 70% of rip-tracking, Stran-Steel Anchor Liners can make a healthy reduction in maintenance costs.

NAILABLE STEEL DOORPOSTS strengthen the vulnerable doorway area against lift truck damage and stand up for years of service. Even repeated nailings of grain doors will not weaken them.

N-S-F and Stran-Steel Anchor Liner with Nailable Steel Doorposts give new and rebuilt freight cars complete protection, lading flexibility. Such cars carry all types of lading—rough, sacked, finished or bulk—and stay in revenue service longer. Information available from Stran-Steel representatives in Chicago, New York, Philadelphia, St. Louis, Cleveland, San Francisco, Minneapolis and Atlanta. In Canada, Stran-Steel Anchor Liner with Nailable Steel Doorposts is sold by International Equipment Co., Ltd., Montreal.

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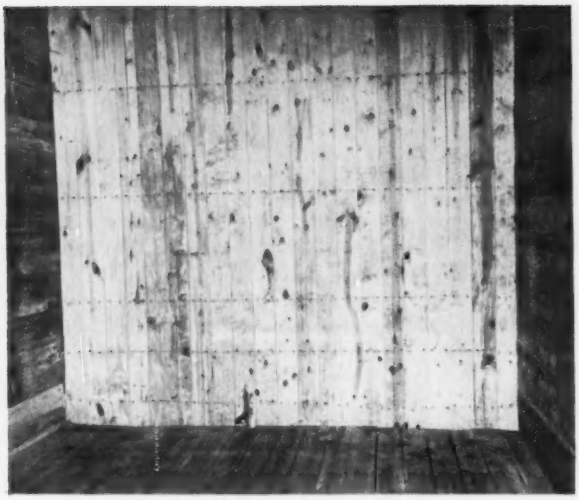
STRAN-STEEL CORPORATION

Detroit 29, Michigan • Division of

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On the Norfolk and Western



Here is before-and-after evidence of the results you get with ADM Freight Liner 810 in boxcars.

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The Norfolk and Western Railway Company began coopering cars with Freight Liner 810 two years ago. The ADM system was found so satisfactory that the line has since Freight-Lined 1,968 cars for shipment of such commodities as paper, flour, tobacco, feed and grain. Today, the N & W uses ADM Freight Liner 810 at five points along its line.

Like so many roads, the Norfolk and Western finds Freight Liner ideal when sealed, smooth interiors are a must. The plastic-and-fiberglass treatment seals rough or broken walls and corners with a smooth, tough surface that is moisture-proof and easy to clean. Of special interest is its ability to seal grease and oil stains, allowing cars to be used for easily-contaminated ladings.

The Pure Food and Drug Administration approves ADM Freight Liner 810 for shipment and storage of foodstuffs.

Freight Liner is popular for other reasons, too. Railroads appreciate its economy, versatility, and ease of application. With a little practice, two men can repair 30 cars a day, patching, relining, and resurfacing. And in most cases, cars can be loaded within three hours after relining.

ADM technical service personnel will be happy to show you how Freight Liner can solve your high-grade loading problems. For a demonstration on your cars at any location, write, wire, or phone ADM Freight Liner System, Archer-Daniels-Midland Company, 700 Investors Building, Minneapolis 2, Minn. (FEderal 3-2112)



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(*Continued from page 34*)

cycle on and off. It would run for several minutes and then would be stopped for a shorter interval. Pete climbed into the machinery compartment and felt the line at the solenoid valve. He mentioned to Lefty that it is normal for the pipe leading away frm the solenoid valve to be cool when the valve is closed. "But that does not tell us anything except that the valve is closing, at least partially.

"Let's close that manual outlet valve on the receiver and stop the liquid at that point. That will give us a positive shut off. If the compressor stops then and stays stopped, it will tell us definitely that the solenoid valve is leaking." While doing this, Pete continued, "We could do this another way, too. We could attach a test light or voltmeter to the terminal connections of the solenoid valve and see if it is cycling on and off. That could prove whether there is thermostat trouble or not. However, I think this will tell the story just as fast.

After liquid valve of receiver was closed, it only took a few minutes for the compressor to pump down and stop. There was no more cycling.

"Well, we know where the trouble is now," said Pete. "I hope that we can fix it. We've got to open that solenoid valve which means we will have to pump-down the system."

"But, isn't it pumped-down now?" asked Lefty.

"Too far down. It's in a vacuum. If we opened it now, a lot of air would be drawn into it. We'll have to open the liquid valve at the receiver, stop the compressor and apply test gages so we will know where we are. We'll pump the system down to about 2 to 3 psi, just like we did before. Then we can open the valve."

The valve was easy to open. The removal of four capscrews loosened the body. Pete very carefully removed the upper portion containing the coil, plunger and spring. Next the diaphragm was removed.

They noticed a little wire ring on the valve seat. "There's our trouble," said Pete triumphantly. "This little ring wouldn't let the valve seat properly. I wonder where it came from," he mused looking puzzled. "It doesn't look like a lockwasher or a shim."

In going over the valve carefully, they were unable to find where the ring belonged. Actually, they were not to find out where it came from until much later. They did notice a small hole in the diaphragm. Pete explained that the purpose of the hole is to operate the valve. The valve operates on pressure differential. When the solenoid is energized, it lifts the plunger which releases the pressure on the top of the diaphragm faster than it can get through the hole in the diaphragm. This means that the pressure under the diaphragm is greater than that on top and the diaphragm lifts letting liquid through.

When the solenoid is de-energized, the plunger drops and closes the pilot port which allows the pressure to build up on the top of the diaphragm. Because the area above the diaphragm is greater than that below, the diaphragm drops, shutting off the flow of liquid.

Lefty and Pete did not realize that normally this type of valve has a wire weep applied to the equalizing hole in the diaphragm. This wire weep is bent with a hook at one end and a loop at the other. The loop is to prevent the wire from falling through and the hook is for applying the weep to the diaphragm. The loop had broken off and the rest of the weep was missing.

They put the valve together and started the system. Apparently the trouble had been corrected. There was no more cycling. They reported to Jim and he released the car.

A short time later, Jim found Pete obviously disgusted and mumbling over a stack of manuals. "What's the matter, Pete? Who you mad at now?"

"Me, and nobody else!" growled Pete. "How I could be so stupid, I'll never know!" Pete was grumbling, but this time about himself.

"Why, what happened?" a surprised Jim asked.

"If I had stopped and looked up that solenoid valve, I would have seen that that loop was part of the weep wire. Now the car has gone and I can't do anything about it. Tell you what you better do, Jim, You'd better advise the car owner to change out that diaphragm in the liquid solenoid valve because the weep wire is missing."

"With it missing, can it cause a failure?" asked Jim.

"No, I don't think it will, if it is changed soon. It's main purpose is to keep the hole in the diaphragm open," said Pete.

As Big Jim walked away, Pete was consoling himself. Everybody makes a mistake now and then.

Piggyback Flat Cars

(*Continued from page 24*)

The top of this decking is flush with the top of the center sill.

The wood deck on the ACF cars is composed of 5 x 2¾-in. oak boards treated with penta-chlorophenol. They are spaced ½-in. apart to make them self-clearing and are secured to the stringers with watertight bolts and Elastic Stop nuts. Oak planks 1½-in. thick are used over the flooring at each side of the ACF trailer hitches to raise the trailer as it passes over the hitch during loading. Over the steel deck at the ends, the driving surface is covered with Diamondette plate.

The deck plate on the Pullman-Standard car has a series of 1-in. holes for drainage. For the non-skid surface, Diamondette plates 29 in. wide are used adjacent to each side sill from end to end of the car, except at the trailer hitches where 1½-in. oak planks are applied over the deck plate. Bridges are pivoted, welded assemblies.

Each car is equipped with ACF trailer hitches and is designed for unidirectional loading, with the forward ends of trailers toward the B end of the car. The pump-handle hand brake is located on a bracket welded to the side sill. All cars have rubber-cushion draft gears.

Trucks are spring-plankless, narrow-pedestal type with Ride Control and $3^{11}/_{16}$-in. spring travel. Package-type 6- x 11-in. roller bearings are applied, and unit-type brake beams are used. Cars are painted with zinc chromate primer and one coat of hot-spray freight-car paint.

Both designs presented challenges to design and production staffs. Because each arrangement is basically an all-welded structure, elaborate welding set-ups are required. Both builders are producing light-weight, economical and functional cars which are providing additional capacity for the fastest growing segment of today's railway freight service.

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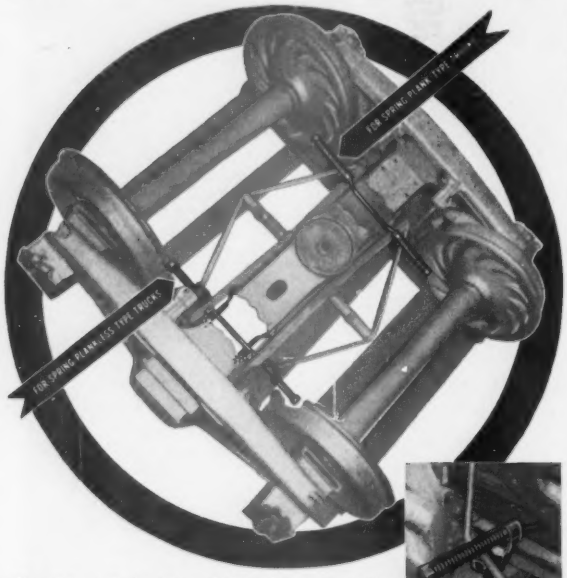
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THE IMPROVED GRIPCO
BRAKE BEAM SAFETY SUPPORT



SPRING-PLANK TYPE

The Gripco Brake Beam Safety Support provides the greatest safety at lowest cost. Its dependability has been proven over years of actual service. Gripco Safety Supports are low in original cost, low in application cost and low in maintenance cost, even after years of service.



SPRING-PLANKLESS TYPE
(Safety Loops Included)

ENGINEERING IMPROVEMENTS

1. One design fits both 5'-6" and 5'-8" wheel base trucks.
2. One rod length and one spring length. One interchangeable casting fits both spring plank and spring plankless trucks.
3. Ideal for interchange repairs. New design permits easy and fast applications under all conditions. Nuts need not be removed to apply or remove the support.

OUTSTANDING FEATURES

1. An inexpensive trouble-free support for Rebuilt Car Programs.
2. Designed for spring plank and spring plankless trucks. Spring plankless trucks require safety loops which can be bolted, riveted or welded to the bolster.
3. Supports the brake beam in the event of brake beam or hanger failure.
4. Holds brake beam in horizontal position.
5. Holds brake shoe in proper position in relation to the periphery of the wheel.
6. The brake release feature pulls brake shoes away from wheel contact instantly when brakes are released.
7. Prevents unnecessary wheel and shoe wear caused by dragging brake shoes.
8. GRIPCO supports can be removed and reapplied without removing nuts; therefore nuts are furnished in proper position.
9. Brake beams, rods, and levers are held in position under spring tension thus reducing false movements, chattering and wear of hangers, hanger pins and brake heads.
10. Can replace as a billable repair any support except A.A.R. recommended practice (angle-riveted and welded).

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Tooling Up for Roller-Bearing Axles

. . . *at Bethlehem Steel*

A growing demand for roller-bearing freight-car axles has resulted in the rearrangement of production facilities and the installation of new equipment in the Johnstown, Pa., plant of the Bethlehem Steel Company. Roller-bearing axles must be produced to closer tolerances than those maintained in the production of axles for solid bearings. With its new installation, each week Bethlehem can now turn out up to 200 car sets of AAR standard or alternate standard roller-bearing axles.

Axle rounds, cut to lengths sufficient to produce individual axles, receive careful surface inspection prior to forging. They are then heated to forging temperature in a three-zone rotary furnace equipped with automatic controls. Two 10,000-lb steam hammers are available for forging these roller-bearing axles. Forging is done in a two-groove die. Die design is such that the axle journal is forged in one groove and the barrel is forged in the other. Half the axle is forged in the first pass. It is then turned end-for-end and the other half forged in the same way.

After forging, the axle is transferred to a straightening press where it is rolled on a flat surface beneath a weight of approximately 27 tons. When the axle has completed one revolution in the press, it is completely straightened. The axles then go into control-cooling pits where residual stresses are eliminated.

When heat-treated axles are ordered, they are normally heat-treated in the as-forged condition prior to any machining. Any combination of annealing, normalizing, quenching and tempering can be done in heat-treating facilities consisting of three furnaces in line with quenching facilities and connected by conveyors for automatic operation.

In the first machining operation, axles are sawed to length, end faces milled, and centers drilled in a four-station automatic machine. The rough turning of journals, dust guards, and wheel seats is done in either of carbide-tool automatic lathes. Both ends are turned simultaneously. Body finishing, when required, is the third operation. It is performed on one of three shaper lathes also equipped with carbide tools.

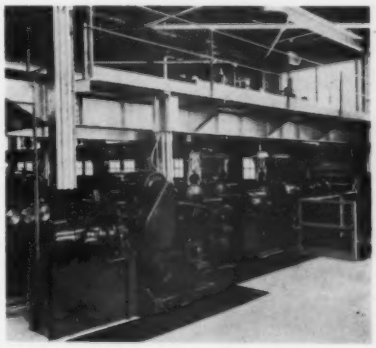
The fourth operation is carried out on a recently installed four-station, automatic-cycle machine which drills and taps the roller-bearing end-cap holes in both ends of the axle at the same time. The first station of the cycle has a set of drills at each end of the machine to spot drill the three holes. The machine then indexes to the next station where the holes are drilled to the desired tapping size and depth. At the succeeding station, the holes are washed out with coolant under high pressure. Tapping is done at the fourth station.

Semi-finish turning of journals, dust guards and wheel seats, the fifth operation, is performed on one of two new tracer control, dual-end drive lathes.

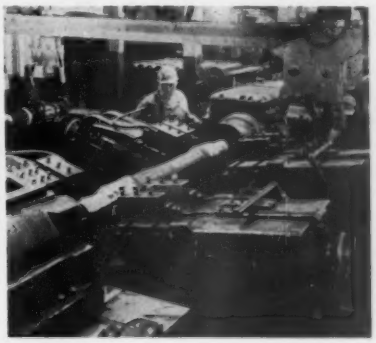
For the sixth operation, there are two contour grinders working from centers on which the journals, dust guards and adjoining fillets are finish ground. Each of these grinders is equipped with a 13¼-in. wide wheel into which the exact contours have been dressed. This allows the contoured wheel to be plunge-cut into the axle, finishing it to the required diameter and giving the finished journals and dust guards exact dimensions in a minimum of time.

Cold rolling, if required, is done on a new hydraulic burnishing lathe. This is seventh and final operation.

Axles are protected to prevent damage in shipment with one coat of African slush; a wrapping of non-rust wax paper; and a wrap of pillo pad, secured with ⅜-in. banding and crimped.



Automatic sequence machine for cut off, and milling and centering of axle forgings, the first step in the machining process.



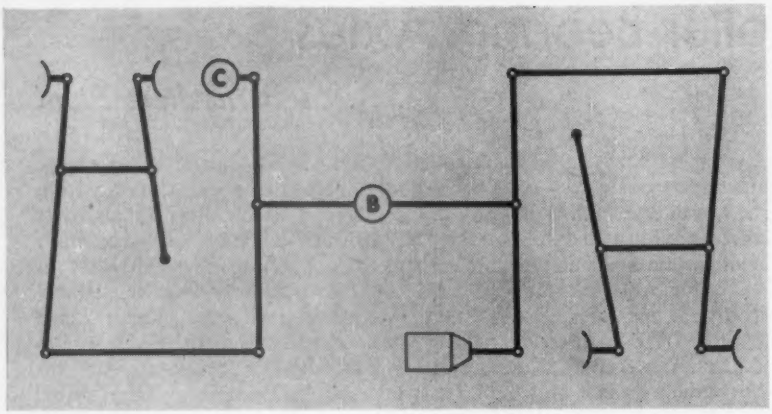
Double-end lathe for rough machining roller-bearing axle forgings. Carbide tools rough cut journals, dust guard, and wheel seats.



Automatic three-stage machine drills, washes out, and taps the roller-bearing end-cap holes in both axle ends simultaneously.



One of two fully automatic, tracer controlled lathes for semi-finish machining of journals, dust guards, and wheel seats.



AAR Mechanical Division will soon issue diagram similar to this showing two permissable locations for automatic slack adjusters on freight cars. Original Group A arrangement has been discarded leaving only Group B and Group C locations. The 85-ft flat cars described on page 23 are typical of recent cars which have been equipped with these devices to eliminate terminal delays.

Today's Approved Automatic Slack Adjusters

Five automatic brake slack adjusters, produced by four manufacturers, presently meet requirements which permit them to be applied to freight cars in interchange service. Rule 3-s-3 of the 1959 Interchange Rules reads: "Slack adjusters, automatic type, applied to cars must comply with AAR standard specifications and have Certificate of Approval."

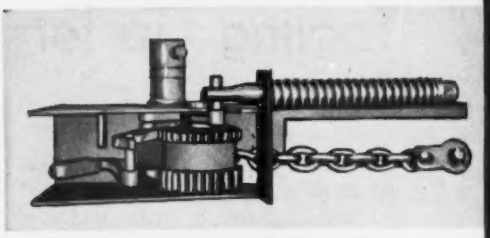
Manufacturers of today's approved adjusters are Ajax Consolidated, American SAB, Westinghouse Air Brake, and Universal Railway Devices. All of the devices are single acting, except for the SAB unit which is double acting.

Preparation of AAR specifications started in 1948. In November 1953, slack adjuster designs were assigned to three groups—A, B and C—so that interchangeability could be worked out for all adjusters within the same group. Group A, covering adjusters applied to the non-pressure head of the brake cylinder or in place of the push rod, was eliminated in July 1957. Group B adjusters are applied to the center (cylinder) rod or pull rod. There are two subgroups: B-1—Mechanical; and B-2—Pneumatic.

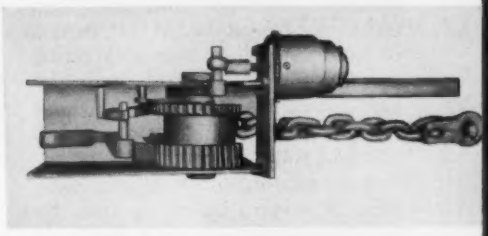
Group C adjusters are of the fulcrum type which are mounted as the floating lever fulcrum. Again, the group is divided: C-1—Mechanical; and C-2—Pneumatic.

Interchangeability requirements were worked out by a manufacturers' engineering committee and coordinated with the AAR. Automatic slack adjusters in groups C-1 and C-2 are interchangeable, provided a properly drilled brake cylinder casting is used when replacing a Group C-1 unit with one from Group C-2. Application of a measuring device and operating rod is necessary when replacing a Group C-2 adjuster with a Group C-1 device. Similar interchangeability exists between Groups B-1 and B-2, provided the original length of the rod is maintained.

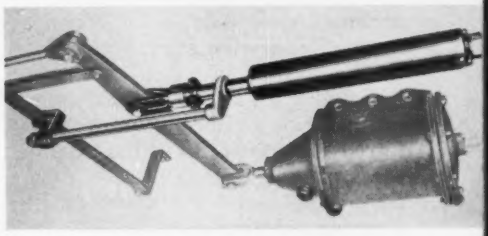
The engineering committee of the slack adjuster manufacturers has detailed drawings covering interchangeability requirements. These are available to others interested in producing slack adjusters. The AAR brake committee is preparing plates illustrating the limiting dimensions established for each group for insertion in the Manual of Standard and Recommended Practice. Alternate locations for Groups B and C have not yet been approved by the committee.



Ajax mechanical adjuster, Type 6825, can be converted to pneumatic type shown below. It received AAR certificate No. 5; is in Group C-1.



Ajax pneumatic adjuster, Type 6800, has design which permits over 21 in. of chain take-up to maintain proper piston travel. It is Group C-2.



American SAB Type DRV is screw-type and double acting. Typical connecting rod installation is shown. Unit is in AAR Group B-1.



Universal brake adjuster received AAR Certificate No. 1. It is mechanical unit, Group C-1, mounted at floating lever fulcrum.



Westinghouse D-111-D pneumatic adjuster requires no mounting brackets; goes between cylinder lever and tie rod; is Group B-2.

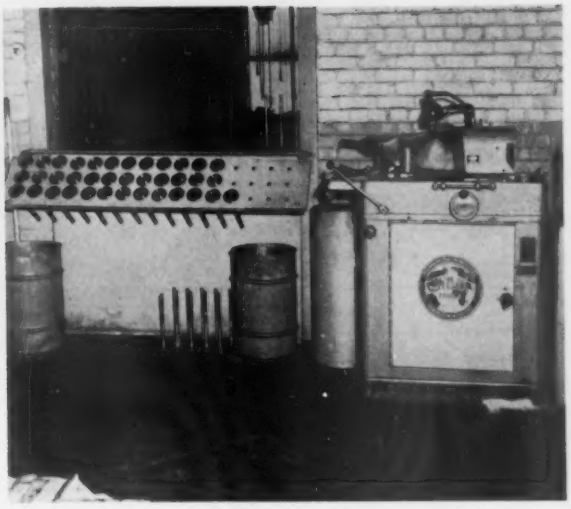
DIESEL REPAIR TIME-SAVERS

Material Carts



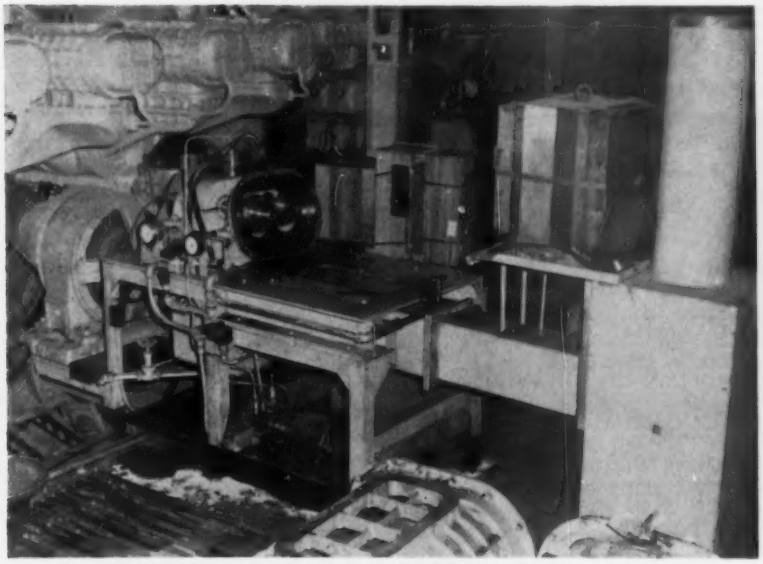
Missouri Pacific uses these carts in running and heavy repair bays at its North Little Rock Ark., shop to stock fast-moving items such as filters, gaskets, cotter, light bulbs and brushes. Separate carts are used for the locomotives of different builders.

Valve Racks



Wall-mounted storage rack for Alco valves is located adjacent to Sioux valve grinder at Frisco's Springfield, Mo., shop. Similar board, also mounted at 45-deg, is used for storing EMD valves after processing on the Albertson machine.

Roots Blower Test Stand

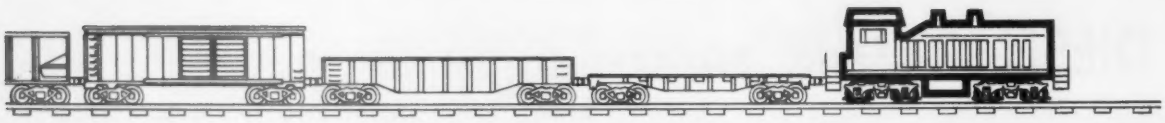


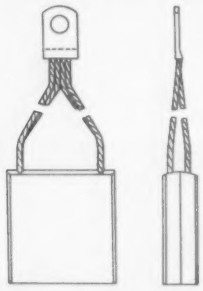
Blowers for Union Pacific's General Motors engines are tested and run in after rebuilding by operating them on this test stand. A 50-hp motor drives the blower through a spline drive. Lubrication and proper oil pressure for the blower are supplied by small pump under the base where the blower is mounted. Procedure is to run the blower at speeds equivalent to the eight throttle positions. A gage measures the air pressure developed in the plenum at the right for the different engine speeds. Air is supplied to the blower below through the filter rack mounted over the outlet duct.

Spring Tester

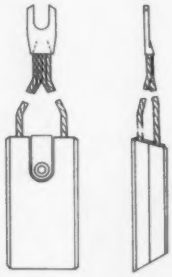


Locomotive spring tester is powered with an air jack. Its gage is calibrated to indicate the pounds of force exerted on the spring. Both elliptical and coil springs are checked each time a truck is rebuilt. Deflection at maximum load and load to make spring go solid are checked.

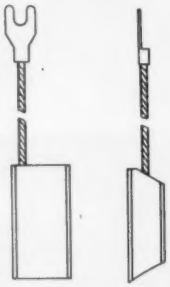




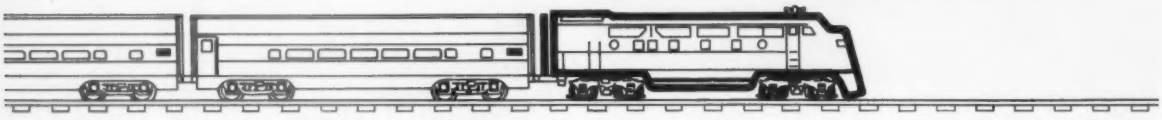
Speer Brush No. 3488-E46
For EMD, MOT—D7, D17, D27, D37, 716E2, 721 721A2

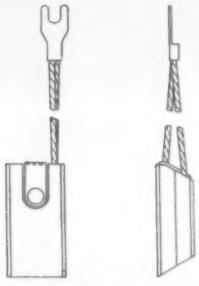


Speer Brush No. 3684-E44
For EMD, GEN.—D12, D15

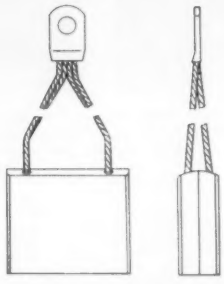


Speer Brush No. 4216-E35
For EMD, AUX GEN — A3001 A7159
BLOWERS—A7158, A7160, A8101

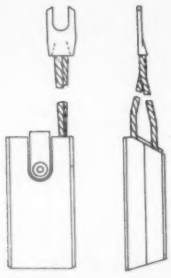




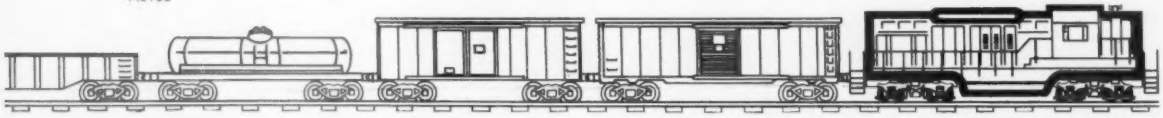
Speer Brush No. 4692-E35
For EMD, AUX GEN — A3001, A7159, A8102
BLOWERS—A7158, A7160, A8101, A8103



Speer Brush No. 3602-E34
For GE, MOT—726 730, 752



Speer Brush No. 3717-E44
For GE, GEN — GT564B1, C1; GT566C1, D1; GT567; GT569; GT576; GT581A1; GT586; GT571



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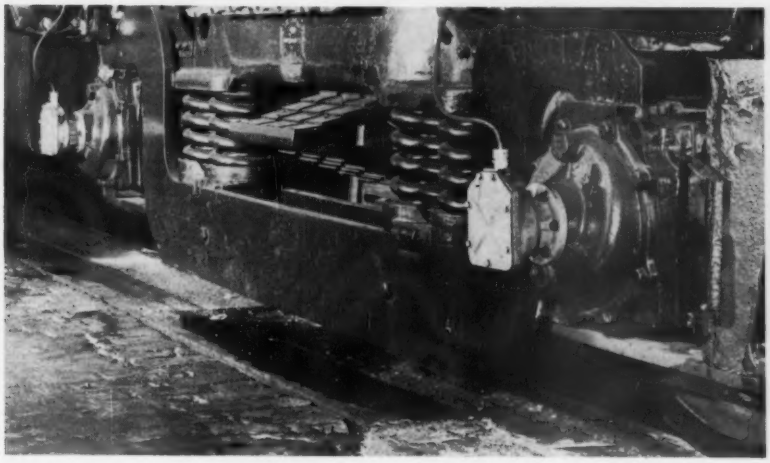
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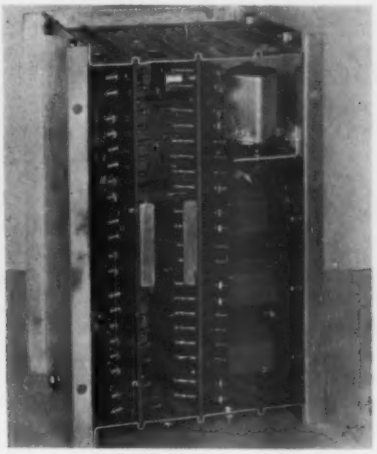


SPEER Carbon Co.
St. Marys, Pa.

ELECTRICAL SECTION



Individual frequency generators are applied to each axle. They are driven through "spade" drives like other speed sensing instruments. Sensitivity of system makes low voltage adequate for operation of the control equipment when this arrangement is used.



Control panel is easy to service and trouble-shoot. Individual circuits are mounted so they can be slid out of racks.

New Wheel Slip-Slide Control Developed

General Electric system has been developed to have controlled sensitivity and rapid response

CONTROLLED SENSITIVITY over a locomotive's entire speed range and protection in both motoring and dynamic braking are features of General Electric's new wheel slip-slide detection system. A frequency signal from a generator on each axle is converted to a d-c voltage which is fed to a voltage comparison network in a detection panel in the locomotive control compartment. If any one voltage is greater or smaller than the others, the network produces an output which is then amplified to operate the wheel slip relay. Long life and low maintenance were goals of this new design.

Roadbed and track maintenance, the presence of a thin moisture-propagated oil film on rails (RL&C, Oct. 1954, p 86), and weight transfer during the starting of heavy trains are all problems involved in the slipping of locomotive driving wheels. Rail damage can result from slips at low speed. Flashovers of motors and generators, and mechanical damage to motor armatures and gears can result from slips at high speeds. Sliding wheels develop flat spots which can become dangerous if allowed to continue. A detection system should have a sensitivity which will give proper protection both at low and high locomotive speeds and a response fast enough to check slipping before damage is done.

The new GE system consists of a frequency signal generator mounted on one journal box of each locomotive driving axle, and a control panel containing a frequency-to-voltage transducer, a voltage comparison circuit, a voltage comparison output detector and a wheel-slip relay.

Frequency Generators

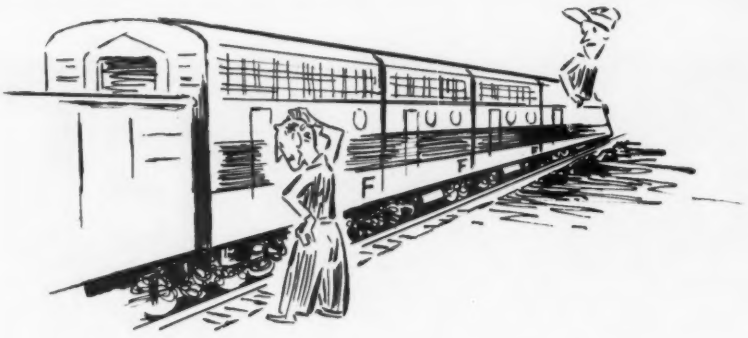
The stator of the frequency signal generator is a glass-reinforced epoxy casting which is held in the housing by four heavy steel springs. The rotor is another epoxy casting. Together, they make up a 40-pole, inductor-type alternator which produces 20 cycles per revolution. In a given position, the flux from 20 like poles is linked through the stator coils while the flux from the 20 opposite poles is shunted. As the rotor turns 9 deg, the flux-switching elements pass to a position under the 20 poles of opposite polarity, reversing the direction of the flux linking the stator coil. At the same time, the flux from the first 20 poles is shunted. Result: an a-c voltage with a frequency proportional to the speed of the rotor is generated in the stator coil.

Because axle-mounted equipment is subject to very high shock stresses, particular emphasis was placed on the strength-to-weight ratio of all components. The complete signal generator weighs only 9 lb and is mounted on the journal box with six bolts.

The frequency-to-voltage transducer consists of a saturating transformer with its secondary connected to suitable rectifiers and filters. The transducer transformer operates between positive and negative saturation and delivers a constant volt-second output for each half cycle. By rectifying and filtering this out-

(*Continued on page 52*)

Case of the Backward F-7



By Gordon Taylor

This case concerns a delay to an important freight train. Like some such cases, it was caused by maintenance men failing to make a complete check of a multiple unit locomotive before dispatching it.

The locomotive consisted of four EMD F-7 units which were assembled for service on the northbound fast freight. Because there was a shortage of A units, the locomotive consisted of one A unit with three trailing B units, all coupled with F (or front) ends forward. This should be noted to fully understand what follows. The locomotive was backed to the train from the "ready track," about a quarter mile away. There it was coupled to its train without incident.

When the locomotive started forward with the train, Engineer Jones noticed the wheel-slip light blink a few times. He also noted that the locomotive did not seem to move out with full power. Jones called to Fireman Riley: "There must be some brakes sticking on one of these units. Wheel-slip light says something is wrong. Check to see if there are any brakes that haven't fully released."

Because it was night, Riley took his flashlight and climbed down to check the locomotive. All brake shoes were hanging free from the wheels, and he reported "No stuck brakes."

Again, they tried moving the train. Again, the locomotive seemed to lack power and the wheel-slip light blinked a few times. The fireman suggested they remove the jumper control cable from the rear unit to see if it was causing the wheel-slip indication. "But that would do no good," replied Jones, "if the slipping is on that rear unit, we'd need the jumper cable to carry the signal. I'll send for the electrician to see if he can help us. In the meantime, you check the reversers on all four units to see if they are lined up for forward movement. Remember, we had no trouble when the locomotive was backing down from the ready track."

Jones started checking reversers and, when he reached the rear unit, found its reverser in "reverse" position. It had not responded to the master reverser switch when it had been changed on the control unit for the "forward" movement of train. By this time, Electrician Sparks had arrived on the scene, and it did not take him too long to find a broken wire to the coil that operates the "forward" magnet valve on the reverser. The coil circuit being broken, the valve could not admit air to the operating air cylinder that moves the reverser to the "forward" position.

Sparks quickly made an emergency repair to the wire connection that permitted the "forward" magnet valve to operate and throw the reverser to forward position so the rear unit could pull its share of the heavily loaded train.

The fireman then said: "No wonder we could not move out with full power; the rear unit must have been pulling against us. The reverser was thrown the wrong way."

"It might seem that way," said Sparks, "but you are wrong." The reverser was set in the wrong position, but the reverse control wire No. 9 was not energized, because the master reverser switch had energized wire No. 8 and had opened the circuit to No. 9 wire. The No. 9 wire could not pass the control current necessary to bring in the series or parallel power contactors to connect the traction motors to the power circuits. Also, the shunt and battery fields of the main generator on unit No. 4 could not be excited, as SH and BF contactors depend on interlocks that are operated by S-14 and S-23 contactors.

"The No. 8 wire could not energize the power contactors, because the "FO" magnet valve would not throw the reverser to forward position. This left C-D interlock on the reverser standing open so it could not pass current necessary to operate the power contactors. All of this left the No. 4 unit helpless to help carry the load. If the rear unit had been an A unit, with its nose end pointed toward the rear in the regular manner, then it would have required a failure of the REV magnet valve connected to No. 9 wire to produce a failure of the kind which occurred here."

"That explanation helps me to understand this better," said the engineer, "but what caused the wheel-slip light to flash?"

"I cannot answer that for certain," replied Sparks, "but the track is rather slick and oily at this location. You were trying to move a heavy tonnage train with less than the usual number of units. It is possible that you got a wheel-slip light because of those conditions."

"You had better get this train moving," Sparks then said, "while I try to solve another problem that is bothering me."

"What problem is that?" asked the engineer.

"It is what I will tell the boss," replied Sparks, "to explain why we ever dispatched a locomotive for service with a defective reverser circuit. This has been one of those diesel days that are best described as diesel daze."

12 Roll Them Out Like New

Commutator Repair

The commutator is a vital part of every d-c motor or generator. It is made up of alternate copper and mica segments, as shown in Fig. 1. The mica segments, or "side mica", separate the copper bars electrically. The bars are wedge-shaped so that when assembled they form a cylinder. Each bar usually has a riser at one end to form the connection with the armature coil.

The bars are clamped between a circular shell and cap. As the cap bolts are tightened the jaws clamp the bars and pull them together to form a rigid cylinder. Mica cones, inserted between the bars and the shell and cap, prevent the shell and cap from grounding and short circuiting the bars.

Commutators are "V-bound" or "arch-bound", depending on how the copper and mica segments are supported in the steel clamping rings. In V-bound commutators, the bars are pulled in by the 30-deg surfaces until there is pressure on the 3-deg surface, Fig. 2. This supports the bar overhangs, but makes the commutator very sensitive to changes in speed or temperature.

In an arch-bound commutator there is no pressure on the 3° surface; therefore tightening the commutator bolts simply increases the pressure between the bars. This leaves the overhangs unsupported and therefore not as sensitive to changes in speed or temperature. Since the overhung portion of the bars is not supported, it may be more susceptible to damage from bumps or blows.

This is the twelfth article in the series covering heavy maintenance of locomotive electrical equipment.

Part 12 is written by R. C. Seymour, Locomotive and Car Equipment Department, General Electric Company, Erie, Pa.

Inspection

A commutator that passes the checkup described in Part 10, should be inspected to determine if it needs further work. Check for surface defects, such as nicks and scratches. For best operation it must be absolutely smooth. Remember that the commutator provides the sliding electrical contact between the fixed brushes and the rotating armature. Any imperfection that will make the brushes jump will cause sparking. This may lead to excessive brush wear and serious trouble, such as bar burning or flashovers.

Mount the commutator on centers and indicate the brush surface to check for waviness, eccentricity and high or low bars. In operation this surface may slide under the brushes as fast as 180 ft per sec, and should be as smooth as possible. In service, the armature operates on bearings rather than on centers so the bearing seats should be "indicated" to make sure they run true with respect to the shaft centers. Waviness or eccentricity, should not exceed one mil for high-speed commutators or two mils for lower speed applications. A variation of about 0.3 mil from one commutator bar to the next is excessive.

Waviness and eccentricity (Fig. 3), if caught early,

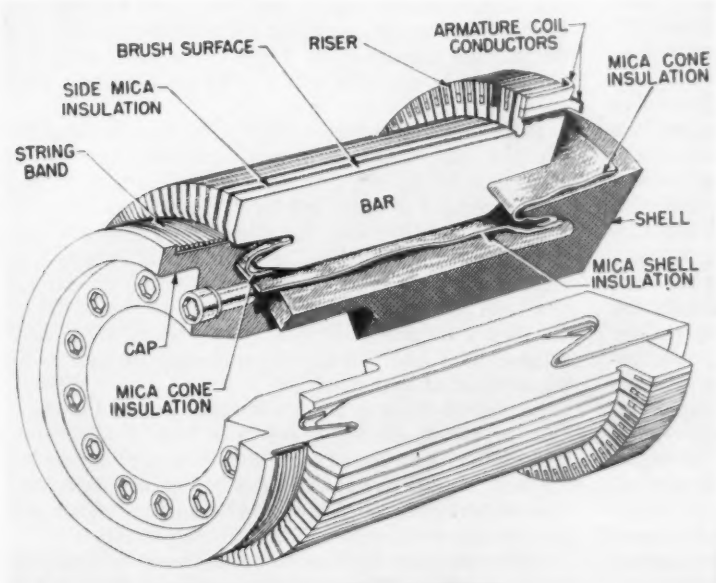


Fig. 1—Cutaway section of a commutator showing principal parts.

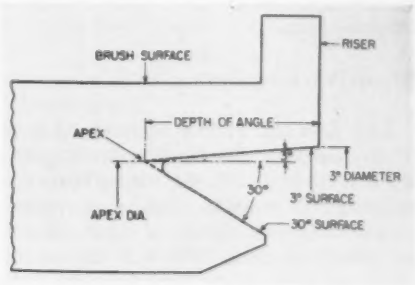


Fig. 2—Commutator bar nomenclature.

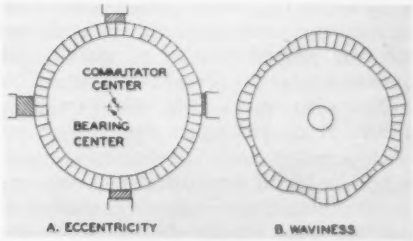


Fig. 3—Exagerated eccentricity and waviness.



Fig. 4—Commutator burning resulted from a bar-to-bar short circuit.

can be corrected by tightening and resurfacing the commutator. Repairing high and low bars is more difficult. This trouble can result from a variety of causes each requiring a different remedy. Find its source if possible.

A bump or blow on the commutator may drive bars down. Low bars can also result from burning. A high bar might be one which had been driven down just before the commutator was surfaced. When the commutator began to run, the bar moved out to its former position and became high with respect to the others. Scattered high bars probably result from a poor cone, or. (in V-bound commutators) too much 3-deg pressure. If most of the bars are high at one or both ends of the commutator, it has probably been run too fast and bent the copper. When this occurs, arch pressure is lost at the ends of the bars. This loosens the side mica, and it will probably break and move out toward the brush surface. The surface gets rough, and poor commutation results.

Repairing Low Bars

Low bars can usually be returned to normal position by spinning the commutator at 20 percent over speed for several hours. If this doesn't work, the bars must be pried into position. First put a substantial wire band around the brush surface of the commutator. Then take out the commutator bolts and remove the cap. Using a screw driver or similar tool, force the bars into position, making the 3-deg and 30-deg surfaces flush with the other bars. Replace the commutator cap and tighten the bolts under the recommended press tonnage; bake for several hours and again tighten under pressure. To insure the proper location of the bars, again spin the commutator at 20 percent over speed.

Bar-to-bar shorts (Fig. 4) can usually be corrected without disassembling the commutator (see Part 10). If much segment insulation has to be dug out, it should be replaced with a synthetic mica paste or similar product. Otherwise, the pocket will quickly fill with carbon dust and cause another short.

To repair a grounded commutator, the segments must usually be removed from the commutator steel. Before disassembly, always either bind the brush surface with wire or hold it with a clamping ring. After the segments have been removed, locate the grounded point and carefully remove all sharp edges from the copper and the steel. If the ground is in the pressure band on the "V's" the steel, may be burned. If the hole is large it must be filled or new steel used. After the defective insulation has been replaced, reassemble the commutator and oven season to cure the new insulation.

Rebuilding

Sometimes the commutator has been damaged beyond repair or is worn to the condemning limit. This limit is reached when the segments get so thin they lift with speed and the commutator looses arch pressure. Condemning limits ar usually given by manufacturers. A new commutator is usually built up on the old cap and shell using a set of assembled segments purchased from the original manufacturer. These come assembled, machined and bound with wire so they are ready for placing on the commutator steel.

Before rebuilding a commutator, thoroughly clean the cap and shell, removing all old insulation. Examine the steel parts for damage or defects such as cracks, burned spots, permanent deflection from overloading or overheating, etc. Also check the angles and dimension and condition of the shell bore. If the old steel is fit to use, smooth up rough spots which might damage the insulation, and paint the barrel of the shell to prevent rust. Use new shell and cone insulation. The old ones have become hard and will not accommodate themselves to the new set of segments.

Be careful to keep foreign material out of the commutator during assembly. Assemble it in a clean area and, if it is arch-bound, seal the clearance gap under the 3-deg surface at once, as described in manufacturer's instructions. After assembly and checking for shorts and grounds, the commutator should be oven seasoned.

Individual bars that are badly damaged or annealed by overheating, may be carefully replaced. First, apply a clamping ring on the commutator, and remove the

set of segments from the shell. Place them on a flat surface, riser end up and loosen the ring slightly. The defective segments can be removed (Fig. 5). As the segment is raised, drive wooden wedges into the space to maintain the arch pressure.

If you are going to make a new segment, use the removed segment as a template. Check the angles on the used segment, they may have become distorted during removal. When trimming the new segment leave stock for machining the angles, but not the brush surface. The new segment must be the same height as the old one to fit correctly when inserted in the commutator. Make sure the brush surface is pushed out against the clamping ring.

If the old mica segment comes out with the copper segment, and can be separated from it without damage, it may be reused. Otherwise, install a new one, trimming the angles to match the new copper segment. If the commutator has extended mica on the riser end, be sure to make allowance for it when trimming the segment. The brush surface of the mica segment should be cut below that of the copper segment so that it will not have to be undercut after assembly.

If more than one segment is to be replaced, remove and replace each segment individually. After all segments have been replaced tighten the clamping ring. Bake the commutator for several hours and tighten the clamping ring again to make sure the assembly is good and tight.

You cannot just slip a new copper or mica segment into an old commutator and have a perfect match. The brush surface will be rough unless the angles are rebored and the commutator put through a baking and pressing cycle after reassembly. During the process the set of segments will have become slightly out of round and must be turned true again. The removed material should be replace with a mica shim in order to obtain correct pressure distribution between the angles on V-bound commutators and correct steel location on arch-bound commutators. Since there is no 3-deg pressure in arch-bound commutators, a shim is required only on the 30-deg surface. After the shims are in place, assemble and oven season the commutator.

If a commutator is rebuilt using the old copper bars and new side mica, number the copper segments as they are removed. Unless they are reassembled in original order, an excessive amount of boring may be required to true up the angles. Trim the brush surface and angles of the new mica to match the copper segments. Stack the segments, riser end up, in the proper order in the clamping ring. Use a plug to help keep the commutator round. Make sure that the brush surface of both copper and mica segments is tight against the ring. Tighten the ring uniformly and treat the commutator the same as after replacing individual copper segments.

Seasoning

Commutators are seasoned to cure the green mica and settle the foundation before finishing, so there is a minimum of shifting in service. The first step, oven seasoning, generally consists of tightening and baking the commutator repeatedly until there is no more appreciable bolt movement. The tightening should be done in a press at the tonnage recommended by the manufacturer. The fixture should bear against the cap as close to the bolt circle as possible so the cap deflection will not change when the press load is removed.

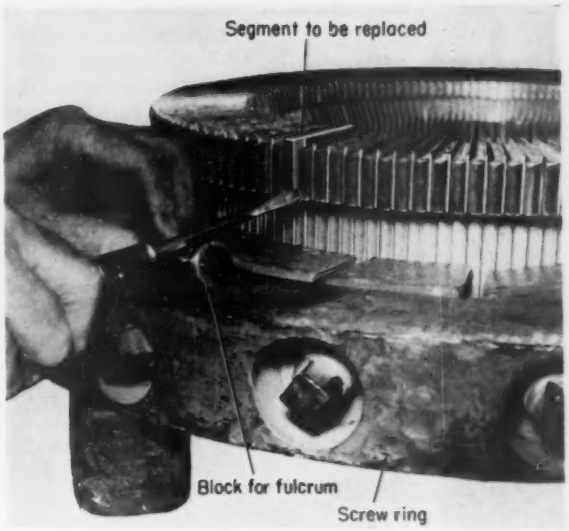


Fig. 5—Method of replacing damaged commutator segment.

If no press is available, hand tightening can be used, but this is not desirable. When hand tightening, set up opposite bolts alternately. Never go around the bolt circle or the commutator will go out of level. After tightening, bake the commutator at temperature recommended by manufacturer for several hours and retighten. If the cap has been removed, the commutator should receive at least one bake after assembly. If new insulation is used, two or three bakes will be required.

During baking and tightening, the commutator cap and copper should be kept fairly level with respect to the back face of the shell. This is important since an out-of-level commutator tends to become eccentric as it heats up in service.

At this point a bar-to-bar test, insulation resistance test, and high-potential test should be made at the prescribed values.

Spinning the Armature

After the armature is wound the commutator should be spin seasoned. Driving the armature leads into the slots, and the heat shock of soldering will cause the segments to shift. The purpose of this second step is to duplicate service conditions so that if any segments are going to shift they do so during the seasoning and not in service.

The armature should be dynamically balanced first so that it can be run at high speed without damaging the spin stand or bearings. Also, it must run smooth enough so vibration does not interfere with "feeling" the commutator. In service, vibrations resulting from a poorly balanced armature can be as detrimental to good commutation as a rough commutator.

The commutator is heated, while spinning at approximately 20 percent overspeed, to 20 to 30-deg C higher than nomral operating temperature, held there for about one hour and then cooled to room temperature. This sequence is repeated as required to obtain a smooth

commutator. Normally, 5 or 6 cycles are required. The commutator is then ground and inspected for smoothness at all speeds, while cold, by holding a carbon brush on the surface. The inspection is repeated with the commutator hot. If it is reasonably smooth, both when cold and hot, and does not move during the cycles, it is satisfactory to use. Otherwise, the above procedure is repeated.

Commutator repair is really more of an art than a science. Like the skillful surgeon, the good commutator man has a background of fundamental knowledge to which he adds a "know-how" developed through repeated practice. This is the skill that cannot be put into a book or taught in a class. It is a major factor in correcting commutator ailments and keeping equipment on the job.

Wheel Slip Control

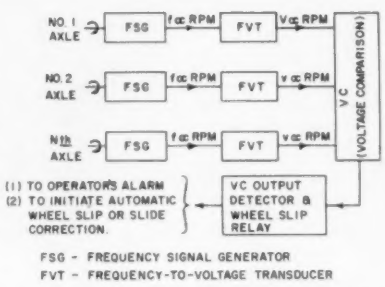
(*Continued from page 47*)

put, a d-c voltage is obtained which is proportional to the frequency of the input signal from the axle generator. The frequency signal from the axle is transmitted to the transducer at a maximum of about 5 volts. This allows the system to operate with an insulation resistance of less than 1,000 ohms between wires running from axles to the control compartment.

The voltage comparison circuit consists of hermetically sealed silicon diodes which are intended to give a reliability and sturdiness comparable with the rest of the system. The circuit can be arranged to receive a varying number of axle inputs. If any one axle is turning a speed higher than the others, or is sliding, voltages proportional to the differential will be produced.

The detector circuit consists of a silicon transistor and two potentiometers which amplify the output of the voltage comparison circuit to operate the wheel-slip relay. The two potentiometers provide the adjustments which give protection throughout the locomotive speed range. The system requires only the frequency signal from the axle generator, and it is not necessary to make circuit adjustments when a generator is changed. All components of the slip-slide panel are designed to simplify trouble shooting and routine maintenance.

To avoid false wheel-slip indications, the system must allow for differences in wheel diameters. This means that the slip differentials to which the system responds must increase with locomotive speed. The maximum differential that can be tolerated without damage also varies with locomotive speeds. Experience has shown that at standstill a maximum slip of 5 mph should be detected to avoid rail damage, but that at maximum locomotive speeds the traction motors should never be subjected to more than a 10-per cent overspeed. The system can be readily adjusted to meet these criteria. The slip differential required to operate the relay at standstill is set by one potentiometer in the detector circuit, and the required slip differential at maximum locomotive speed is set by the other.



Schematic of wheel slip-slide control system involves three stages preliminary to the voltage comparison output detector and wheel slip relay. Arrangement can be designed to accommodate varying number of axle signals.

Another significant factor in the performance of a wheel slip-slide detection system is its speed of response. This should be low enough to prevent unnecessary action on minor self-correcting slips, but sufficiently fast to initiate corrective action before a slip becomes serious enough to cause damage. With the axle generator producing a frequency of 20 cycles per revolution, slip differentials of 5 mph can be detected in approximately 250 milliseconds. A proportionately shorter time is required to detect slips of greater magnitude.

C&O Brake Shop

(*Continued from page 27*)

passing material requisitions and the issuing of material.

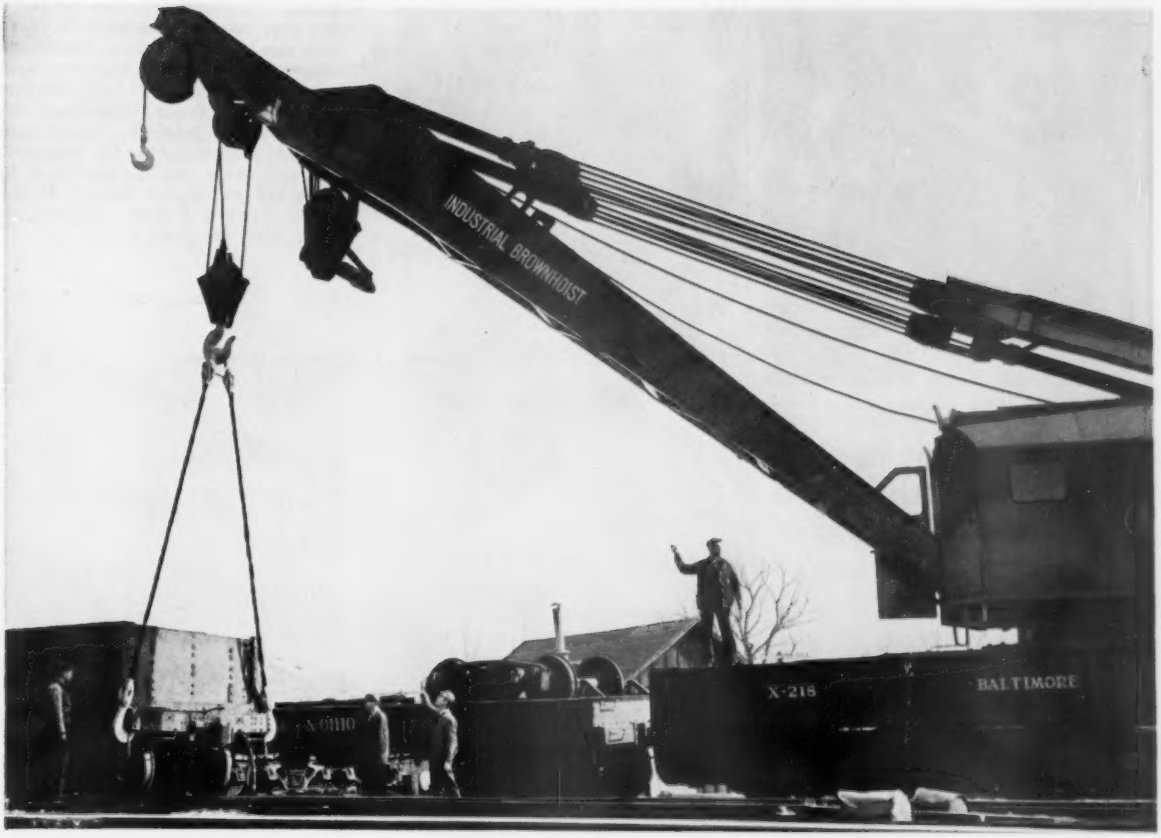
Close cooperation between the air brake foreman and the section storekeeper has contributed much to make this arrangement an outstanding success. Having free access to the stores department section at all times has enabled the air brake foreman to alert the storekeeper of impending shortages resulting from anticipated heavy demand for certain materials.

A considerable amount of the output of this air room is for locomotives at outlying points. Covered metal shipping skids holding from one to three locomotive sets are used. These skids have compartments which limit excessive movement of the valves and thereby prevent damage en route. The covered skids are used also for returning dirty equipment when removed from the locomotive. Paper work in stores department handling has been cut to a minimum since all the necessary equipment for one diesel is ordered by the skid load without a detailed listing of the valves.

As already mentioned, this shop does not process all the C&O brake equipment. It does, however, concentrate on the repair of portions which have failed to pass rack or service tests at other points. Clifton Forge, Va., Russell, Ky., and Grand Rapids, Mich., do the same sort of locomotive brake equipment cleaning as is done at Huntington. However, if a cleaned portion fails to operate properly, it is then sent to Huntington for further testing and repair.

The same practices apply to AB portions. Huntington processes portions for outlying points without test racks. In addition, portions which fail to pass rack tests at points such as the car shop at Russell, are sent to Huntington. Recently the shop was processing 700 air brake portions monthly, and 75 per cent of which required repairs of some nature. Output of locomotive brake equipment has been running 13 to 14 complete sets per week, and about 3 sets of UC passenger equipment are processed daily.

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What's New

(*Continued from page 18*)

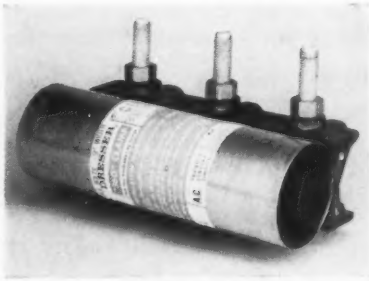


Wheel-Turning Tools

The new Kendex tread and flange profiling tools have been designed specifically for wheel turning on Niles (illustrated) and Sellers lathes. Using clamped, turn-over-type inserts with multiple cutting edges, the tools eliminate all regrinding. When one cutting edge becomes dull, the insert is given a quarter turn to a new edge, until all edges of each side have been used. Insert replacement, a simple operation, is controlled by one screw in the clamp.

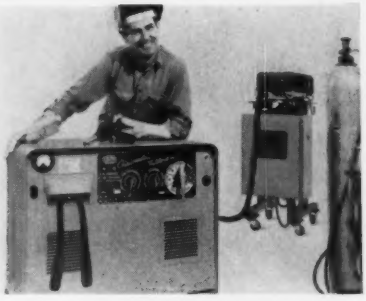
A solid Kennametal shim provides a solid seat for the insert and permits harder, more wear-resistant grades of Kennametal to be used. Chipbreakers of Kennametal provide better chip control and eliminate much grinding expense.

The tools, which have been under development and test in shops of several railroads for the past two years, are said to have reduced tool change time, improved finish, and reduced tool costs. *Kennametal Inc., Dept. RLC, Latrobe, Pa.*



Repair Clamp

The Dresser 2- and 3-in. "360" repair clamp is an all-around clamp. It is made of stainless steel and Grade A malleable iron lugs and can also be used as a coupling. Asbestos-cement pipe with broken ends can be used with the "360" simply by evening the ends of the pipe and joining. Odd lengths of plain-end cast-iron pipe can also be coupled with lugs on only one side. To operate, the bolts are removed from the lugs, the clamp sprung around the pipe, the bolts reinserted, and the nuts tightened. The finger design gasket, which provides positive sealing over a greater range of adjustability, conforms to the pipe, cushioning it from shock and movement. *Dresser Manufacturing Division, Dresser Industries, Inc., Dept. RLC, Bradford, Pa.*



Dip Transfer Welding

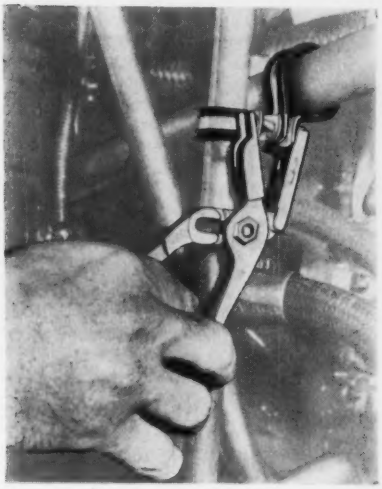
This gas-shielded metal-arc welding for mild and low-alloy steel uses a power supply with an inductance that properly regulates the rise and decay of current to produce a pulsing arc with a frequency of 100 to 200 cycles per sec. The arc occurs at relatively low voltage. The electrode contacts the molten pool, giving a short circuit which causes a high current surge. Overheating by resistance to this current flow at the surface of the weld pool causes metal to be wiped from the electrode and contact is broken, re-establishing the high arc current. This sequence is said to result in metal transfer without a spatter, because the metal is not projected through the arc stream, and to give a molten pool which will not sag or run out. Current levels below 200 amp and wires less than .045 in. produce best results. Vertical and overhead welding at deposition rates of 6 lb per hr can be achieved in heavy sections, and the equipment makes satisfactory welds in sheets .253 in. and below. *Air Reduction Sales Co., a Division of Air Reduction Co., Dept. RLC, 150 East 42nd st., New York, 17.*

Color-Flecked Textured Enamel

Plextone, a multi-colored spray paint, clings to any material with little or no surface preparation and is said to conceal weld marks and other imperfections. It is non-toxic and free from odor and spray dust. No spray room is needed; spraying can be done simultaneously with other operations. The one, two, or more colors that may be selected for a single coat retain their original coloring without fussing. The multi-colored surface can be

keyed to resemble textured wallpaper, marble, leather, granite, cork, or other surfacings.

The paint has anti-static properties that resist dust, and it is said to have the scuff-resistance of approximately five coats of ordinary paint. *Plextone Corp., of America, Dept. RLC, 2141 McCarter Highway, Newark 4, N.J.*



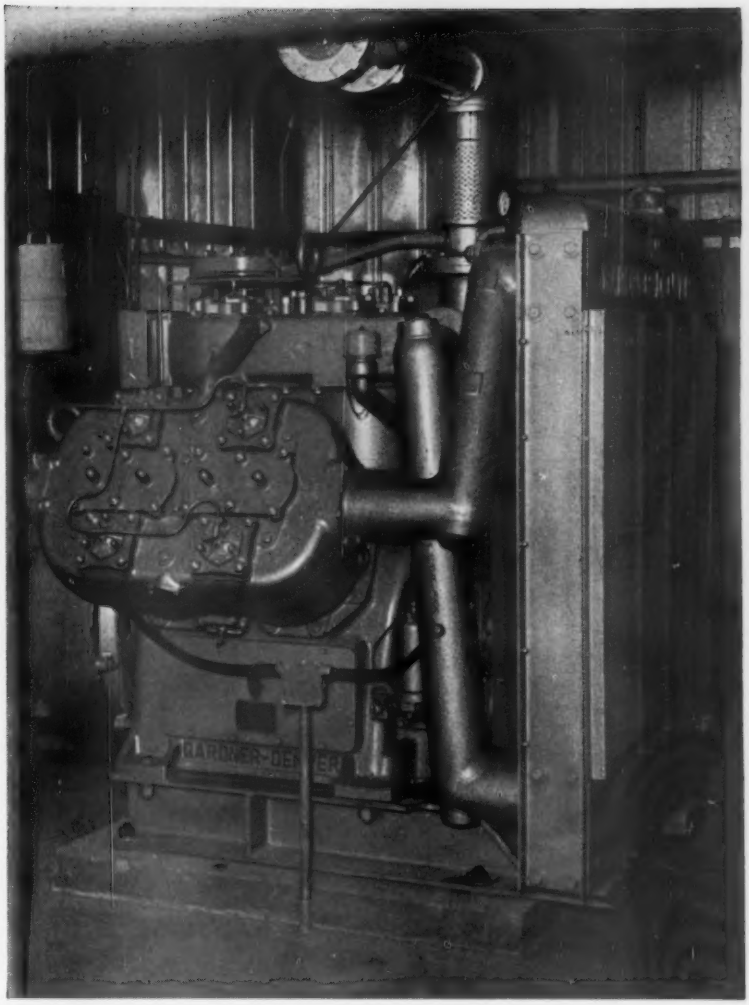
Pliers for Use in Cramped Quarters

A plier that secures bolt while clamp is mechanically closed and locked in place frees both hands for attaching nut or for stacking additional clamps. It is said to cut clamp installation time up to 50 per cent. Misalignment is prevented because proper closure is insured at all times, and worker fatigue is greatly reduced. At present the pliers are limited to the standard No. 8 or No. 10 size bosts. *TA Manufacturing Corporation, Dept. RLC, P.O. Box 39757, Los Angeles 39, Cal.*

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12—42" Locomotive Wheels — 7¼" Bore
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Left—High pressure surge testing hose assemblies at Stratoflex plant.

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Report

(*Continued from page 8*)

Redipak, Rolin, Spring Pack and Unipak.

The committee has withdrawn conditional-approval and approved-for-test status from all Miller lubricators, including the Hycar core design. Action taken on the Miller lubricator does not require the removal of units in serviceable condition on cars now in interchange service, but bars any new installations. The committee also recommended to the Arbitration Committee that provision be made in the Interchange Rules to permit Miller lubricators, removed at the time of periodic relubrication, to be reapplied to foreign cars only if the car was previously equipped with Miller lubricators.

Railway Cyclopedias—A Correction

The 15th edition of the Locomotive Cyclopedia was published in 1956, not the 14th as announced in the May issue. This Cyclopedia is now available at half price —$6 retail; $5 to railroad employees.

Personal Mention

Chesapeake & Ohio.—*Russell, Ky.:* W. O. BRADLEY appointed shop superintendent, succeeding J. G. RAYBURN, retired. E. C. DUNCAN appointed assistant shop superintendent, succeeding Mr. Bradley. M. I. TAYLOR appointed electrical supervisor diesels, succeeding I. R. DIEHL, retired. *Richmond, Va.:* A. G. HALL appointed car lubrication inspector. *Huntington, W. Va.:* R. I. GOWDY appointed system boiler inspector. E. C. KREGER appointed system supervisor welding. *Ashland, Ky.:* F. R. CRAFT appointed general foreman.

New York Central.—*New York:* ROBERT S. HAMILTON appointed assistant chief mechanical officer. Mr. Hamilton, assistant to vice-president—operation, since January 21, formerly assistant chief mechanical officer for the Southern at Washington, D.C.

New York, New Haven & Hartford.—*New Haven, Conn.:* RUSSELL H. DAVIS, superintendent car maintenance, appointed mechanical superintendent. Title changes: F. J. DEBRUYN from superintendent locomotive department to assistant mechanical superintendent—locomotives; JOSEPH M. QUINN from superintendent car maintenance to assistant mechanical superintendent—cars, and GEORGE A. CLARKE from chief mechanical engineer to assistant mechanical superintendent—engineering. R. W. HOOPER, general superintendent—car department, appointed assistant director of research. Former position abolished. *Dover Street Enginehouse:* HARRY A. CLEMENT appointed general foreman, succeeding WALTER L. DOOLEY, retired. *Providence, R.I.:* JOHN M. BORON appointed general foreman, locomotive and car departments, succeeding FRANCIS WHITAKER, retired.

Supply Trade Notes

ELLCON - NATIONAL, INC. — *Ellcon-National* formed by merger of *National Brake Company* with the *Ellcon Company*. *Chester T. Stansfield* is president of merged companies; *Everard C. Mersereau*, executive vice-president; *Walter L. Giles*, vice-president; and *Elmil P. Kindra*, vice-president in charge of sales.

■

GUSTIN-BACON MANUFACTURING COMPANY.—*J. T. Conlon*, vice-president in charge of engineering, elected president, succeeding *J. D. Simmons*, who continues as a consultant for the company.

■

BULLARD COMPANY. — *E. P. Bullard III*, president, named chief executive officer, succeeding *E. C. Bullard*, retired.

■

SAFETY ELECTRICAL EQUIPMENT CORPORATION. — Safety Electrical has acquired assets of *Electrical Division, Safety Industries, Inc. Robert B. Dodds*, former vice-president and general manager of Electrical Division, named executive vice-president, in charge of operations. *John J. Kennedy*, vice-president in charge of sales, continues as such for new firm.

■

YOUNGSTOWN SHEET & TUBE CO. —*Clarence E. Short*, assistant district sales manager at Minneapolis, Minn., appointed district sales manager, succeeding *Charles S. Hogan*, retired.

■

KERSHAW MANUFACTURING COMPANY.—*Western Railroad Supply Company* appointed as exclusive agent for Kershaw car inspector's car used by mechanical departments in checking rolling stock.

■

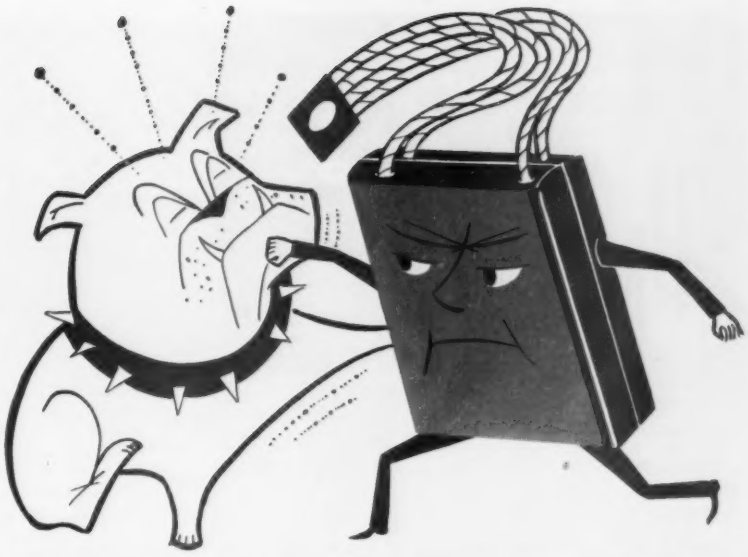
BINKS MANUFACTURING COMPANY.—Sales representatives appointed as follows: *Robert Hamlin*, Cleveland; *J. Coughlin*, Columbus, Ohio; *Robert E. Moser*, Virginia territory. Field representatives: *Ed Gogin*, San Francisco branch; *Dan E. Power, Jr.*, and *William B. Crawford*, Atlanta branch. *A. Glines* and *A. McMillan* to serve New England territory.

■

AMERICAN BRAKE SHOE COMPANY, RAILROAD PRODUCTS DIVISION.—*John F. Ducey, Jr.*, manager of Brake Shoe products, appointed manager of new products. *William N. Hulme* appointed manager of Brake Shoe products. *Ray A. Burt*, sales representative, succeeds Mr. Hulme as district sales manager in San Francisco, and *William A. Wheeler*, sales representative, has been transferred from Chicago to San Francisco.

■

HUCK MANUFACTURING COMPANY. —*Richard C. McNeill* appointed regional manager, covering eastern Ohio (including Cleveland), western Pennsylvania (including Pittsburgh), and northern West Virginia.



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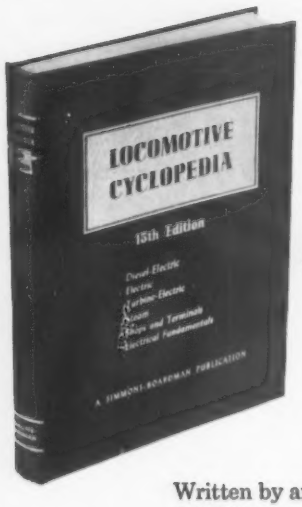
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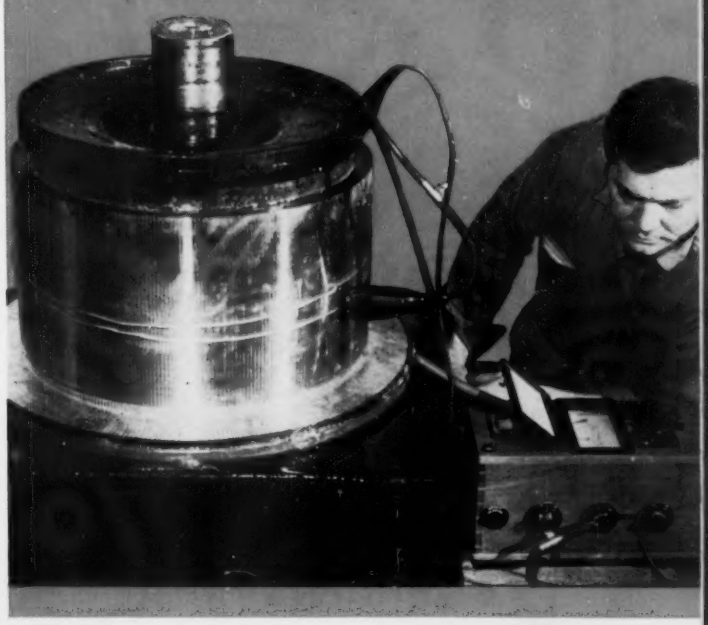
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